

# The lynx and nursery-web spider families in Israel (Araneae, Oxyopidae and Pisauridae)

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Levy G. 1999. — The lynx and nursery-web spider families in Israel (Araneae, Oxyopidae and Pisauridae). *Zoosystema* 21 (1) : 29-64.

## ABSTRACT

The lynx spiders genera *Oxyopes* Latreille, 1804 and *Peucetia* Thorell, 1869 and the nursery-web spiders of the genera *Pisaura* Simon, 1885 and *Rothus* Simon, 1898 in Israel are revised. These versatile hunters form a conspicuous component of the Middle East vegetation-dwelling spider fauna. *Oxyopes* is represented by nine species. Only three out of these were formerly reported while the unknown female of one (*O. sabrinus* O. P.-Cambridge, 1872) is described here for the first time. Three are new species: *O. nanulineatus*, *O. sinaiticus* and *O. mediterraneus*, and three others constitute new records of species with rather disjunct distributions. *Oxyopes optabilis* O. P.-Cambridge, 1872 is newly synonymized with *O. heterophthalmus* (Latreille, 1804), whereas *O. attica* Hadjissarantos, 1940, *O. maracandensis* Charitonov, 1946, and *O. eymiri* Karol, 1967 are new synonyms of *O. globifer* Simon, 1876. *Peucetia* was known from Israel only by *P. virescens* (O. P.-Cambridge, 1872), however, the male is illustrated here for the first time. Two additional *Peucetia* species form new records. The possibly endemic *Pisaura consocia* (O. P.-Cambridge, 1872) and the taxonomically problematic Palearctic *P. mirabilis* (Clerck, 1757) are addressed, and the first representative in Asia of the African genus *Rothus* is described.

## KEY WORDS

Araneae,  
*Oxyopes*,  
*Peucetia*,  
*Pisaura*,  
*Rothus*,  
Middle East.

## RÉSUMÉ

*Les familles d'araignées Oxyopidae et Pisauridae d'Israël.*

Les genres *Oxyopes* Latreille, 1804 et *Peucetia* Thorell, 1869 (araignées-lynx) ainsi que les genres *Pisaura* Simon, 1885 et *Rothus* Simon, 1898 (qui construisent des « toiles pouponnières ») d'Israël sont révisés. Ces araignées prédatrices représentent une importante partie de la faune qui peuple les buissons du Moyen-Orient. *Oxyopes* est représenté par neuf espèces. Trois d'entre elles seulement étaient connues jusqu'ici. La femelle de *O. sabrinus* O. P.-Cambridge, 1872 est décrite ici pour la première fois. Trois nouvelles espèces sont également décrites : *O. nanulineatus*, *O. sinaiticus* et *O. mediterraneus*. Trois autres ont été récoltées dans des aires où elles n'avaient pas été signalées auparavant. *Oxyopes optabilis* O. P.-Cambridge, 1872 a été récemment reconnu synonyme de *O. heterophthalmus* (Latreille, 1804), tandis que *Oxyopes attica* Hadjissarantos, 1940, *O. maracadenis* Charitonov, 1946 et *O. eymiri* Karol, 1967 sont identifiées à *O. globifer* Simon, 1876. Le mâle de *Peucetia virescens* (O. P.-Cambridge, 1872) (seule espèce connue d'Israël jusqu'ici) est décrit pour la première fois. Deux espèces de *Peucetia* s'ajoutent à la liste. *Pisaura consocia* (O. P.-Cambridge, 1872) probablement endémique, et l'espèce paléarctique *P. mirabilis* (Clerck, 1757) sont mentionnées et le premier représentant en Asie du genre africain *Rothus* est décrit.

## MOTS CLÉS

Araneae,  
*Oxyopes*,  
*Peucetia*,  
*Pisaura*,  
*Rothus*,  
Moyen-Orient.

## INTRODUCTION

Adults of the spider families Oxyopidae and Pisauridae in Israel are cursorial hunters that are usually found among vegetation. All are three-clawed and armed with serrated bristles for handling silk and their young may construct webs at certain stages. In tropical and southern parts of the world the adults of some members of these families are known as sedentary web-builders (Lawrence 1964; Griswold 1983; for additional references see Shear 1986). A possible evolutionary shift from web weavers to hunters has been suggested by Rovner (1980) and further elaborated by Jackson (1986). Each of the two families comprises several hundred species in the world. With populations occasionally rather abundant, they constitute an important component of the vegetation-dwelling spider guild. The spider families considered here along with a former study on the funnel-weavers, the Agelenidae of Israel (Levy 1996), provide an updated profile of

the main spider communities of the low-shrub and herbaceous plants in Israel.

Out of the twelve oxyopids known at present from Israel only four have been previously recorded here. In addition three new species are described along with the unknown female of a species described over 120 years ago. Five species prove to be new records from Israel, in part new for the entire Middle East, providing clues for zoogeographic patterns reaching far beyond the regional scope. Among the latter are records of species known thus far only from Yemen or the Badkhyz Desert in Turkmenia.

Considering the Israeli pisaurids these may blend with the vegetation by their colour but are easily detected while they seem to roll over a disproportionate large egg-sac held underneath their body or by their often conspicuous nursery-webs. The two *Pisaura* species found in Israel include a possible endemic. In addition the first occurrence in Asia of a representative of the African genus *Rothus* is reported.

## MATERIAL AND METHODS

The present study is based on material deposited in the collections of the Hebrew University of Jerusalem (HUJ). Localities in Israel are listed from north to south and co-ordinates (Israel grid) are given for less well-known places. Drawings are of specimens from Israel, unless otherwise indicated. Measurements (mm) from preserved adult specimens, ten of each sex if available, are given and ranges are stated. The length of the leg given is the combined length of all segments (each measured separately) from femur to tarsus; the more proximal segments are excluded. The proportional indices used are given in "Abbreviations" (see below). The leg formula indicates the longest leg by the first digit and the shortest by the last. Taxonomic references to taxa include, among others, those accompanied by useful illustrations not listed in the current araneological catalogs.

## ABBREVIATIONS

HECO	Hope Entomological Collections, University Museum, Oxford, U. K.;
HUJ	Hebrew University of Jerusalem, Israel;
MNHN	Muséum national d'Histoire naturelle, Paris, France;
NMW	Naturhistorisches Museum, Vienna, Austria;
SMF	Natur-Museum und Forschungs-Institut Senckenberg, Frankfurt, Germany;
ZMUM	Zoological Museum of the Moscow State University, Russia.
AME	anterior median eye;
carapace index	length divided by width;
clypeus index	height of clypeus divided by diameter of anterior median eye;
MOQ	Median Ocular Quadrangle (measured in profile from frontal edges of AME to hind edges of PME);
MOQ/cly	longitudinal axis of MOQ divided by clypeus height;
patella-tibia index	combined length of both segments of leg-I divided by length of carapace.
PME	posterior median eyes;
PM index	space between PME eyes divided by diameter of one PME.

## SYSTEMATICS

## Family OXYOPIDAE Thorell, 1870

## REMARKS

The lynx spiders are usually taken by sweeping vegetation. They are easily recognized among the plant-dwelling spiders by the many erect spines on their legs and the peculiar hexagonal eye arrangement. The carapace is high and convex, sloping sharply at the sides and has a vertical clypeus in front. All possess eight eyes. Legs are with notched trochanters and three claws, two of them pectinate. They have three pairs of spinnerets and a colulus. The opisthosoma usually tapers to a pointed end. Two genera are present in Israel.

Genus *Oxyopes* Latreille, 1804

TYPE SPECIES. — By monotypy: *Oxyopes heterophthalmus* Latreille, 1804.

## DESCRIPTION

Medium-sized spiders, usually less than 10 mm in body length. Blackish to light coloured, but not green, occasionally tinted with red. Integument densely covered with flattened scales and scattered ordinary setae. Carapace longer than wide (Fig. 1A). Anterior row of eyes strongly recurved with anterior-medians much smaller than anterior-laterals (Fig. 1A, B). Posterior row of eyes clearly procurved. Distance between anterior-lateral eyes subequals distance between posterior-median eyes (outlined rectangular, Fig. 1B). Eyes of posterior row placed at subequal distances. Inner distance between posterior-median eyes much longer than diameter of a posterior-median eye. Labium longer than wide and exceeded in length by the palpal endites (Fig. 1D). Chelicerae usually with one promarginal and one retromarginal tooth (Fig. 1E). Legs long and spinous. Leg formula: IV, I, II, III or I, IV, II, III or I, II, IV, III. Opisthosoma oval, often with a median mark on dorsum and venter. Tibia of male palpus short and armed with apophyses, sometimes markedly enlarged (Fig. 2A, B); bulbous with median, fleshy, tegular outgrowth rising up to tip of embolus (Figs 4A, B, 18A, B); no paracymbium. Female

epigynum usually with raised, tongue-like, median extension, often protruding in profile (Figs 3A, B, 8A, B, 15A, B).

#### REMARKS

Over two hundred *Oxyopes* species, mainly from the warmer parts of the world, are catalogued, but many are known only by their first description. *Oxyopes* species are generally considered diurnal, versatile active foragers or they may take to sit-and-wait strategies. They are often seen running, making erratic moves and jumps in herbaceous vegetation. An American species is found also on woody vegetation: conifers and deciduous trees (Brady 1964: 490). At night they have been observed to be immobile, suspended by a thread of silk from the underside of leaves and apparently are best collected by sweeping at night (Lowrie 1971: 349). The copulatory behaviour of *Oxyopes* comprises long courtship followed by very brief mating while hanging inverted on a silken thread (Gerhardt 1933; Cutler *et al.* 1977). The large, unique tibial apophysis of the male palpus of *O. heterophthalmus* often breaks off and is found stuck inside the epigastric furrow of the female, below the epigynal plate (not inside notches on the epigynum). Its breaking occurs possibly during a sudden partly circular turn made by the male while mating (Gerhardt 1933: 29). Evidently, the male holotype of *O. optabilis* O. P. Cambridge, 1872 turned out to be an *O. heterophthalmus* male in which both palpi have amputated tibial apophyses. The whitish, flattened, lenticular egg-sac is fastened firmly to twigs of shrubs or graminaceous stalks and is guarded by the female (Berland 1927: 20). The young emerge after three to four weeks and the female may then lay another egg-sac. The female may eat while on guard (Jennings & Pase 1975) or not feed during this period of time (Berland 1927).

Three species of *Oxyopes* have been previously reported from Israel: *lineatus* (as *gentilis*), *heterophthalmus* and *sobrinus*. The female of the latter is described here for the first time. In addition there are three new records for the Middle East: *globifer*, *pigmentatus* and *badhyzius*, and three are new species, namely *mediterraneus*, *nanulineatus* and *sinaiticus*. There is a close resemblance among *lineatus*, *nanulineatus*,

*sobrinus* and *sinaiticus* representing apparently a common evolutionary line, differing from that formed by *globifer* and *mediterraneus*, whereas *heterophthalmus*, *pigmentatus* and *badhyzius* belong each to a separate line.

Distinctions by colours, found in old descriptions are useless since nearly all shades, from yellow to almost black may appear in a single population. Two names of doubtful application were given to Egyptian species that cannot be traced in collections nor are they identifiable by their descriptions: *Sphusis alexandrinus* Audouin, 1826 and the immature *Oxyopes bilineatus* O. P. Cambridge, 1876. Considering the occurrence of several species of close resemblance in xeric habitats of the Middle East, these names should thus be regarded as *nomina dubia*.

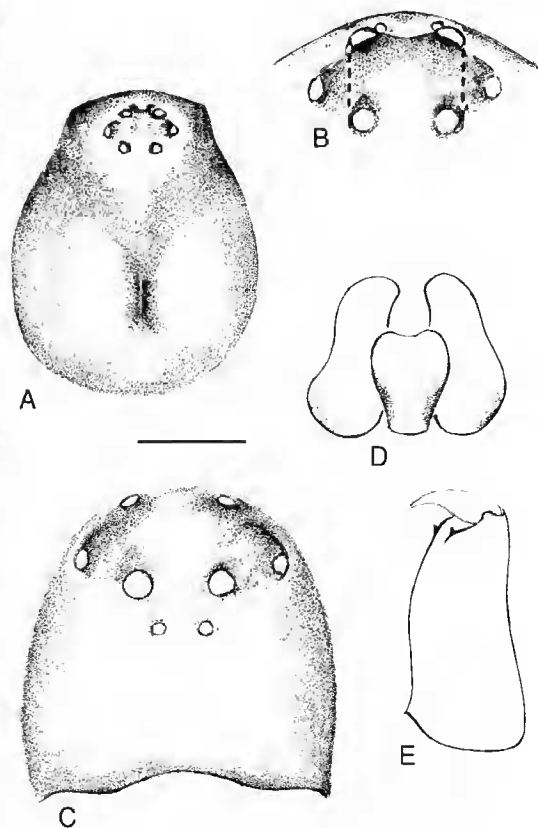


FIG. 1. — *Oxyopes*; A, carapace, dorsal view; B, eye arrangement, dorsal view, detail; characteristic rectangle outlined; C, eye arrangement, frontal view; D, labium and palpal endites; E, left chelicera, inner view. Scale bar: A, 1 mm; B-E, 0.5 mm.



***Oxyopes heterophthalmus* (Latreille, 1804)**  
(Figs 1-3)

*Aranea heterophthalma* Latreille, 1804b: 280; type from France, presumably lost.

*Oxyopes heterophthalmus* — Latreille 1804a: 135. — Roewer 1954a: 318. — Bonnet 1958: 3229. — Brady 1964: figs 100, 101. — Azheganova 1968: 42, figs 64, 65. — Loksa 1969: 128, fig. 86a, b. — Platnick 1989: 430; 1993: 589.

*Oxyopes optabilis* O. P.-Cambridge, 1872: 315; ♂ holotype (with broken tibial apophyses of palpi) from the Plains of the Jordan, Israel (HECO, B.808, t.8; examined); syn.n.

**DIAGNOSIS.** — The unique structure of the tibial apophyses of the male palpus and the large epigynal cone

of the female with the coiled spermathecae, distinguish *O. heterophthalmus* easily from all other *Oxyopes* species.

**DISTRIBUTION.** — Palearctic.

**RECORDS.** — Israel from Mt. Meron in the Galilee to the Judean Hills and down to Jericho.

**DESCRIPTION**

*Male*

Measurements (10 ♂♂): total length 5.4-7.2; carapace length 2.6-3.2, width 2.0-2.4, index 1.26-1.30; clypeus index 5.67-7.0; MOQ/cly ratio 1.21-1.47; PM index 1.77-2.08; leg

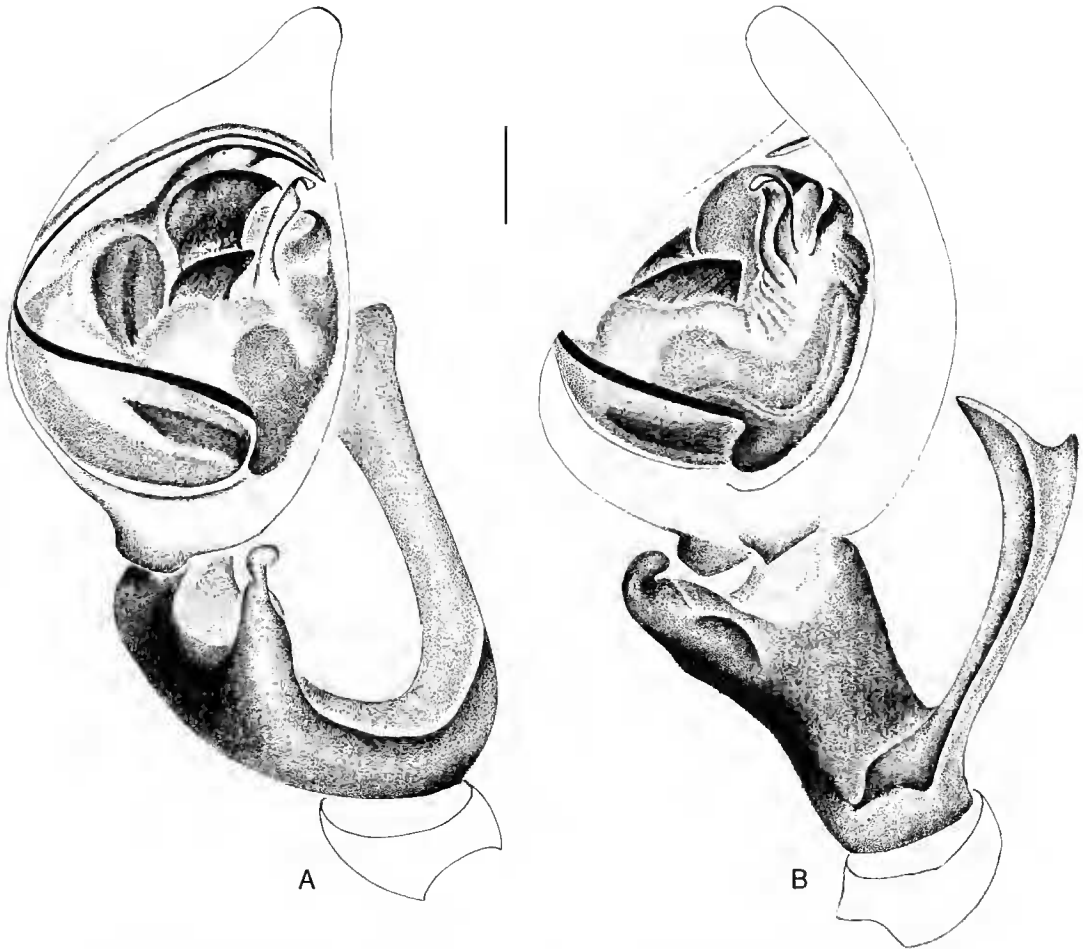


FIG. 2. — *Oxyopes heterophthalmus* ♂, left palpus; A, ventral view; B, retrolateral view. Scale bar: 0.25 mm.

lengths: I 9.7-13.3, II 9.0-11.6, III 7.2-9.4, IV 8.1-10.6; patella-tibia index 1.19-1.46.

**Palpus.** Tibia with short ventral apophysis and big, laterally bent, sclerotic apophysis that often breaks off at base (Fig. 2A, B); bulbus basally traversed by long, filiform embolus running apically along mesal side; bulbus at centre armed with thick, slightly rugged blackish process, ridged brown lamella and whitish regular outgrowth (Fig. 2A, B).

#### Female

Measurements (10 ♀♀): total length 6.5-10.5; carapace length 2.8-3.8, width 2.1-3.0, index 1.25-1.38; clypeus index 6.4-9.2; MOQ/cly ratio 1.01-1.24; PM index 1.75-2.26; leg lengths: I 10.0-13.3, II 9.1-12.5, III 7.5-10.3, IV 8.5-11.8; patella-tibia index 1.09-1.31.

**Epigynum.** Relatively large with flattened, cone-like, sclerotic extension rising at middle (Fig. 3A, B). Spermathecae contain narrow, tightly coiled tubes (Fig. 3C).

#### COMMENTS

*Oxyopes heterophthalmus* which lives in the heat of Jericho, the lowest point on Earth, and

extends as far as England, should be considered an out-standing adaptive species. Adult males were collected in Israel from February to April and females from March to May. Courtship of specimens from Jerusalem was observed in April (Gerhardt 1933: 28). The first records of *O. heterophthalmus* from Israel are by O. P.-Cambridge (1872: 314; as *O. lineatus* Walckenaer, not Latreille 1806; ♂♂ and ♀♀ HECO, B.808, t.6; examined) followed by his (1872: 315) amputated *O. optabilis*. Further records of *optabilis* from Syria and Libya (Bonnet 1958: 3236) are considered unacceptable. Additional previous records of *O. heterophthalmus* from Israel are by Pavesi (1895: 8) and Strand (1913: 162), and from Syria by Kerville (Damascus 1926: 70).

*Oxyopes heterophthalmus* serves as the type-species of *Oxyopes*, but the peculiar palpal structures of the male and the shape of the spermathecae of the female shared by the closely related, Central Russian *O. takobius* Andreeva *et* Tyschenko, 1969 and the Chinese *O. foliiformis* Song, 1991 place these in a secluded position among the numerous known *Oxyopes* species. Future revisions may thus result in excluding most species currently included in *Oxyopes*.

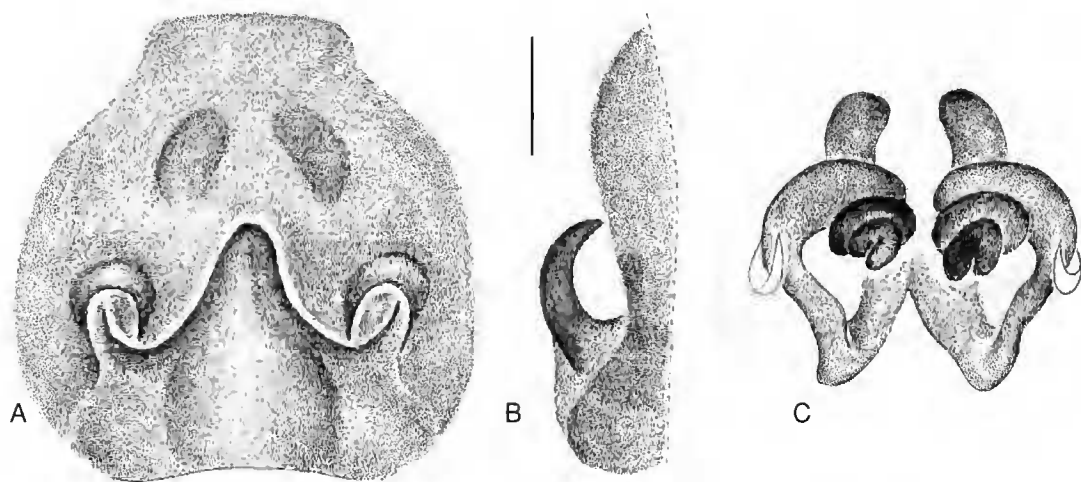


FIG. 3. — *Oxyopes heterophthalmus* ♀; A, epigynum, ventral view; B, epigynum, lateral view; C, spermathecae, dorsal, inner view. Scale bar: 0.25 mm.

***Oxyopes lineatus* Latreille, 1806**  
(Figs 4, 5)

*Oxyopes lineatus* Latreille, 1806: 117, pl. 5, fig. 5; type from France, presumably lost. — Roewer 1954a: 319. — Bonnet 1958: 3233. — Loksa 1969: 128, fig. 86c, d. — Brignoli 1977: 74, figs 42, 43.

— Barrientos 1984: 153, figs 1a-c, 2. — Weiss 1989: 1, figs 1-4, 9-13. — Heimer & Nentwig 1991: 352, fig. 914.

**DIAGNOSIS.** — The shape of the male palpus with the elongated bulbus, the basally notched cymbium, the shape of the tegular and tibial apophyses and the shape of the tongue-like, elongated epigynal extension

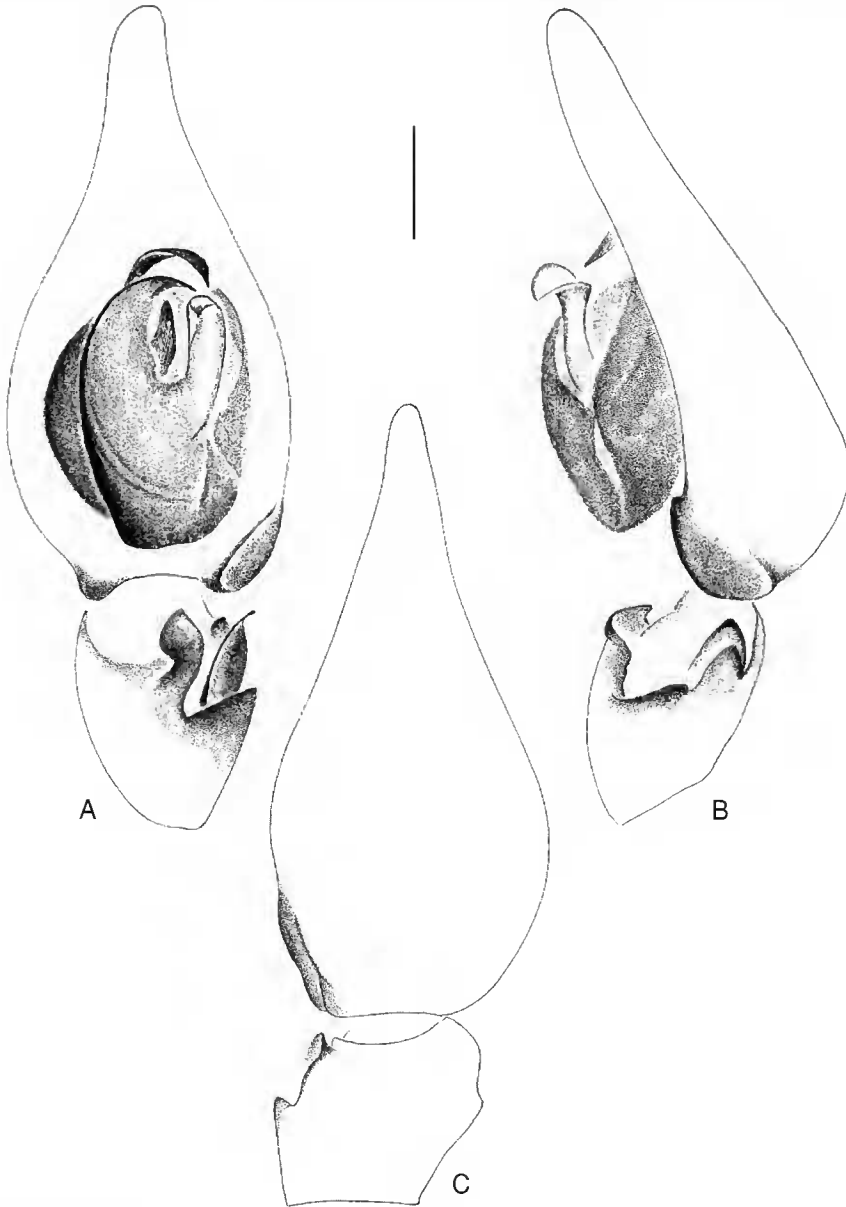


FIG. 4. — *Oxyopes lineatus* ♂, left palpus; A, ventral view; B, retrolateral view; C, dorsal view. Scale bar: 0.25 mm.

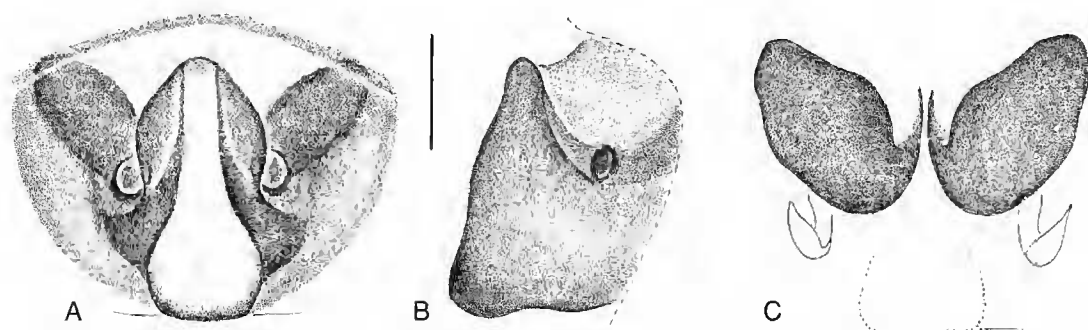


FIG. 5. — *Oxyopes lineatus* ♀; **A**, epigynum, ventral view; **B**, epigynum, lateral view; **C**, spermathecae, dorsal, inner view. Scale bar: 0.1 mm.

of the female are characters that distinguish *O. lineatus* from all other *Oxyopes* species.

**DISTRIBUTION.** — Southern Europe to Russia, Syria, Lebanon, Israel.

**RECORDS.** — Israel, in the mountainous parts from the foothills of Mt. Hermon to the Judean Hills.

#### DESCRIPTION

##### Male

Measurements (10 ♂♂): total length 4.2–6.2; carapace length 2.1–2.8, width 1.5–2.1, index 1.27–1.42; clypeus index 4.86–6.22; MOQ/cly ratio 1.45–1.97; PM index 1.7–2.0; leg lengths: I 7.8–12.3, II 7.0–11.0, III 5.8–8.7, IV 6.7–10.5; patella-tibia index 1.19–1.48.

**Palpus.** Bulbus elongated. Cymbium much extended apically, with clear concavity on basalectal side (Fig. 4A–C); thick tip of embolus bends under blackish tip of conductor (Fig. 4A); bulbus medially bears brown, sclerotized process projecting alongside whitish, regular outgrowth (Fig. 4A). Apical edges of scooped tibia extend into partly spiriferous ventral apophysis and retrolateral protrusions (Fig. 4A, B).

##### Female

Measurements (10 ♀♀): total length 5.1–7.2; carapace length 2.4–3.1, width 1.8–2.3, index 1.30–1.44; clypeus index 5.9–6.8; MOQ/cly ratio 1.25–1.59; PM index 1.8–2.0; leg lengths: I 8.5–11.8, II 7.8–10.9, III 6.4–8.9, IV 7.8–10.5; patella-tibia index 1.19–1.28.

**Epigynum.** Elongated, light median tongue-like

extension nearly twice as long as wide, flanked on sides by transparent membranes (Fig. 5A); median elevated extension nearly quadrate in profile (Fig. 5B). Spermathecae consist of compact bodies (Fig. 5C).

#### COMMENTS

Adult males were collected in Israel in May–June and females from April to June. The occurrence in the Middle East of *O. lineatus* was noted formerly by O. P.-Cambridge (1872: 314; as *gentilis*, ♂♂ and ♀♀ from Nazareth, Israel, and Beirut, Lebanon, HECO, B.808, t.2; examined), Pavesi (1895: 8; as *transalpinus*, from Lebanon), Kerville (1926: 70, from Syria and Lebanon) and Brignoli (1978a: 207, from Lebanon). Examination of numerous specimens from France (MNHN, B.2258, n° 692) corroborated the above identification. *Oxyopes lineatus* is found in Israel only in the mesic central and northern parts and is thus considered a North Mediterranean element of this fauna. Whether and where it occurs in northern Africa (Bonnet 1958: 3235) should be re-investigated. Evidently, there are several species, including some described below, that inhabit arid or semi-arid habitats and could be mistaken for *O. lineatus*.

#### *Oxyopes nanolineatus* n.sp. (Fig. 6)

**HOLOTYPE.** — Adult ♀ from near the inflow of River Jordan into Lake Kinneret (2080/2555), Israel, leg.

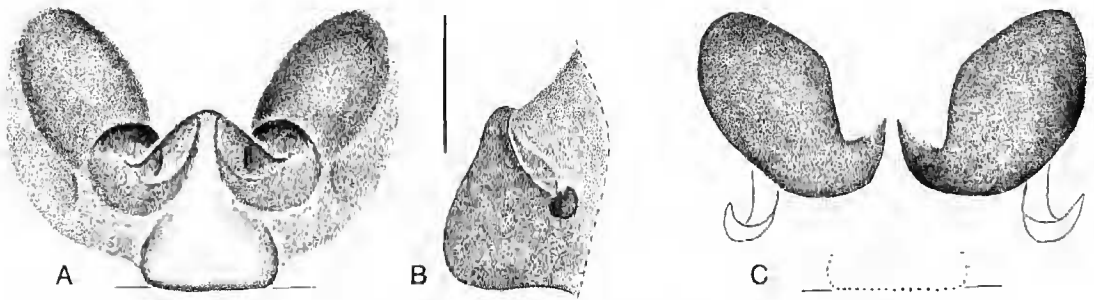


FIG. 6. — *Oxyopes nanolineatus* n.sp. ♀, holotype; A, epigynum, ventral view; B, epigynum, lateral view; C, spermathecae, dorsal, inner view. Scale bar: 0.1 mm.

G. Levy, 24.VI.1973 (HUI 15146); ♂ paratype with same data (HUI 15147).

**ETYMOLOGY.** — The specific name denotes the small size (nanos = dwarf), and the close relationship between this species and *O. lineatus*.

**DIAGNOSIS.** — *Oxyopes nanolineatus* is a compact, dwarf form that resembles *O. lineatus* very closely. Although the males, apart from their size, cannot be separated by their palpal configuration from *O. lineatus*, the females can be distinguished by the different shape of the epigynal plate. The two apparently are allopatric and do not share the same ecological niche. *Oxyopes nanolineatus* so far has been found only near water, a habitat where no *O. lineatus* has been taken.

**DISTRIBUTION.** — Israel.

**RECORDS.** — Israel, HaGoshrim, pond at Bab el-Hawa (Golan Heights), Jordan inflow into Lake Kinneret, inflow of Nahal Samakh into Lake Kinneret, Bet Yosef on banks of river Jordan.

#### DESCRIPTION

##### Male

Measurements (4 ♂♂): total length 3.7-4.0; carapace length 1.8-1.9, width 1.4-1.5, index 1.26-1.36; clypeus index 3.50-3.75; MOQ/cly ratio 2.20-2.25; PM index 1.5-1.6; leg lengths: I 6.9-7.4, II 6.2-6.6, III 5.0-5.3, IV 5.9-6.4; patella-tibia index 1.21-1.39.

**Palpus.** Shape of bulb and tibia like *O. lineatus* but in miniature.

##### Female

Measurements (of holotype + 7 ♀♀; holotype listed first): total length 5.1, 3.9-5.2; carapace

length 2.2, 1.9-2.4, width 1.6, 1.3-1.8, index 1.38, 1.27-1.46; clypeus index 5.13, 4.44-5.11; MOQ/cly ratio 1.78, 1.67-1.97; PM index 1.8, 1.5-1.9; leg lengths: I 7.3, 6.2-8.3, II 7.0, 5.8-7.9, III 6.2, 4.8-6.7, IV 7.0, 5.5-7.9; patella-tibia index 1.18, 1.11-1.28.

**Epigynum.** Short, central elevated portion about as wide as long; membranous edges extend inwards into blackish orifices (Fig. 6A); median elevation viewed in profile (Fig. 6B). Structure of spermathecae (Fig. 6C).

#### COMMENTS

Adults were collected in March, June and July. A similar phenomenon of a riparian species in which merely the females can be separated from a closely resembling species living away from water is known in the funnel-weavers *Agelescape livida* (Simon, 1875) and *A. affinis* (Kulczyński, 1911) (see Levy 1996).

#### *Oxyopes sobrinus* O. P.-Cambridge, 1872 (Figs 7, 8)

*Oxyopes sobrinus* O. P.-Cambridge, 1872: 314; ♂ holotype from the Plains of the Jordan, Israel (HECO, B.808, t.3; examined).

**DIAGNOSIS.** — *Oxyopes sobrinus* resembles *O. lineatus* superficially but is easily distinguished also from other *Oxyopes* species by the male palpus with the peculiar median protuberance, by the form of the regular outgrowth and by the shape of the tibial apophyses as well as by the shape of the median epigynal elevation of the female with the projections on the sides.

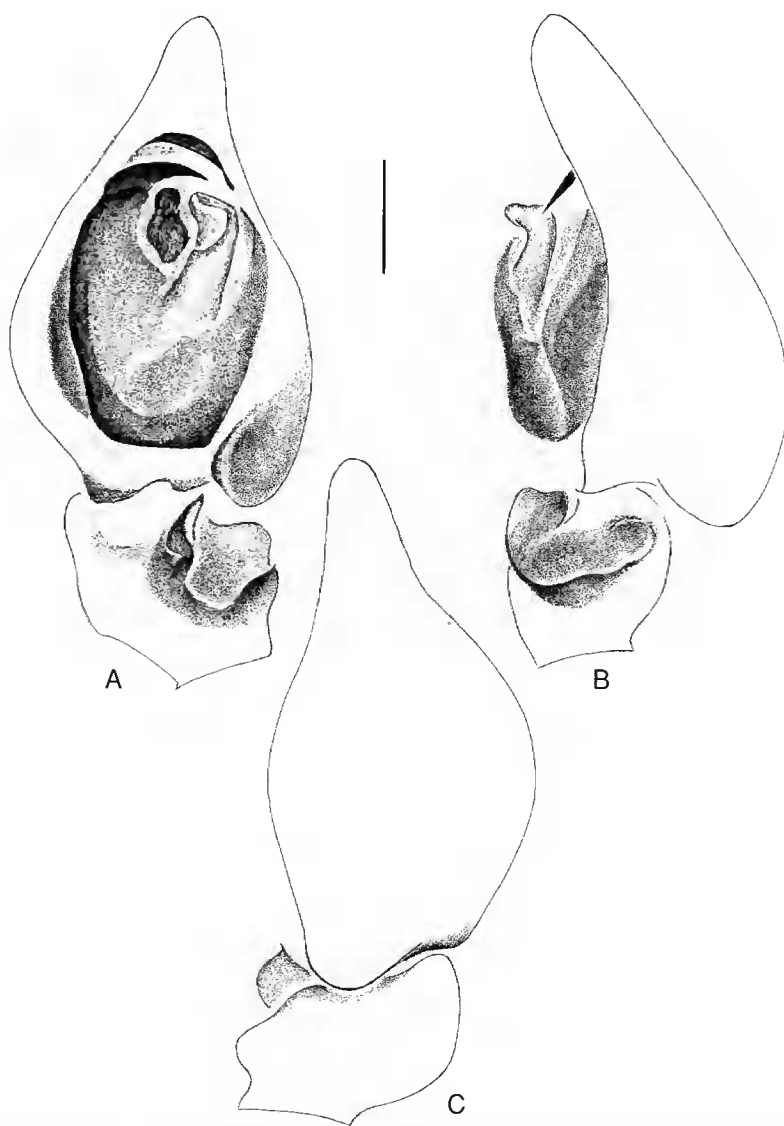


FIG. 7. — *Oxyopes sobrinus* ♂, left palpus; A, ventral view; B, retrolateral view; C, dorsal view. Scale bar: 0.25 mm.

DISTRIBUTION. — Israel; Libya, needs verification.

RECORDS. — Israel, Dead Sea area, Arad, Sede Boqer and surroundings, Makhtesh Ramon.

#### DESCRIPTION

##### Male

Measurements (10 ♂♂): total length 4.4-6.2; carapace length 2.2-3.2, width 1.7-2.5, index

1.22-1.35; clypeus index 3.80-5.09; MOQ/cly ratio 1.71-1.98; PM index 1.5-1.9; leg lengths: I 7.7-11.3, II 7.4-9.9, III 5.2-8.5, IV 7.5-10.5; patella-tibia index 1.13-1.25.

**Palpus.** Cymbium expanded at basal-ectal corner (Fig. 7A-C); thick end of embolus bends under black tip of conductor; bulbous bears medially a brownish massive protuberance partly surrounded by whitish regular outgrowth (Fig. 7A);

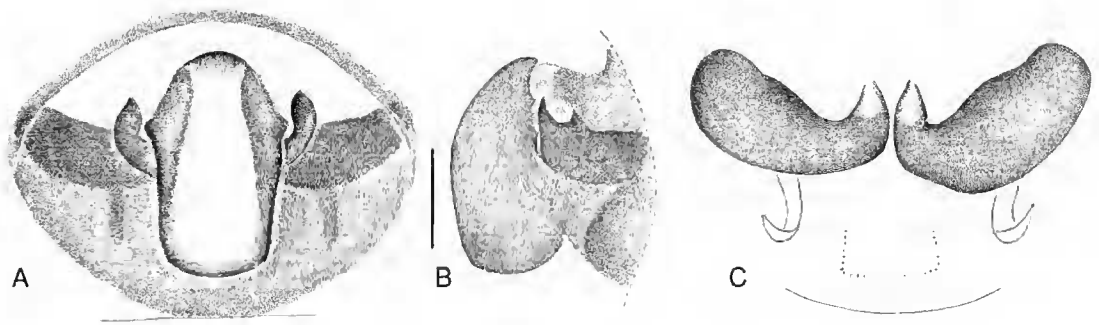


FIG. 8. — *Oxyopes sobrinus* ♀; A, epigynum, ventral view; B, epigynum, lateral view; C, spermathecae, dorsal, inner view. Scale bar: 0.1 mm.

apical edges of scooped tibia extend on mesal side into raised, partly transparent expansion (Fig. 7A, B).

#### Female

Measurements (9 ♀♀), total length 5.7-9.4; carapace length 2.5-3.6, width 1.9-2.6, index 1.30-1.43; clypeus index 4.7-6.2; MOQ/cly ratio 1.33-1.77; PM index 1.4-1.9; leg lengths: I 8.5-11.9, II 7.7-11.5; III 6.1-9.8, IV 7.9-12.0; patella-tibia index 1.07-1.16.

**Epigynum.** Raised, median, white opaque extension forms along with lateral, membranous margins a bulging rectangle accompanied on each side by a thick protuberance (Fig. 8A); median elevation on epigynum bulges appreciably in profile (Fig. 8B). Spermathecae (Fig. 8C).

#### COMMENTS

Several species of general resemblance are found in the deserts of the Middle East and northern Africa. Considering, however, that no illustration of *O. sobrinus* was ever published and the female is described here for the first time, the records from Libya listed in catalogues need to be confirmed.

Adults of *O. sobrinus* are found from February to August. Males have occasionally been found in pitfall traps. Populations were found to comprise black and yellow members. Apparently the light coloured are more often encountered in the summer months of July-August.

#### *Oxyopes sinaiticus* n.sp. (Fig. 9)

**HOLOTYPE.** — Adult ♀ from En Higiya (994/867), Sinai, Egypt, leg. A. Shulov, 24.IV.1968 (HUJ 15148).

**ETYMOLOGY.** — The specific name refers to the type locality.

**DIAGNOSIS.** — Based on female, *Oxyopes sinaiticus* belongs to the *O. lineatus* group of species but can be clearly distinguished by the shape of the epigynal and spermathecal structures.

**DISTRIBUTION.** — Egypt, known only from the type locality in Sinai.

#### DESCRIPTION

##### Male

Unknown.

##### Female

Measurements (of holotype): total length 5.9; carapace length 2.4, width 1.8, index 1.33; clypeus index 5.22; MOQ/cly ratio 1.7; PM index 1.8; leg lengths: I 8.1, II 7.7, III 5.4, IV 7.9; patella-tibia index 1.16.

**Epigynum.** Relatively very small. Nearly semi-circular, raised median expansion, yellow at centre and transparent at upper edges; expansions extend on sides to epigastric furrow (Fig. 9A); median elevation rounded in profile (Fig. 9B); black spermathecal bodies slightly twisted (Fig. 9C).

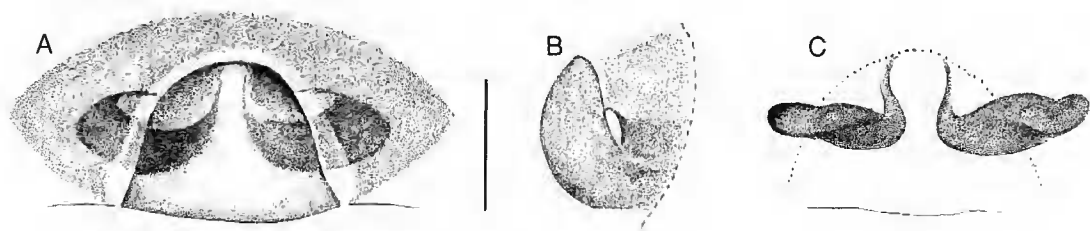


FIG. 9. — *Oxyopes sinaiticus* n.sp. ♀, holotype; A, epigynum, ventral view; B, epigynum, lateral view; C, spermathecae, dorsal, inner view. Scale bar: 0.1 mm.

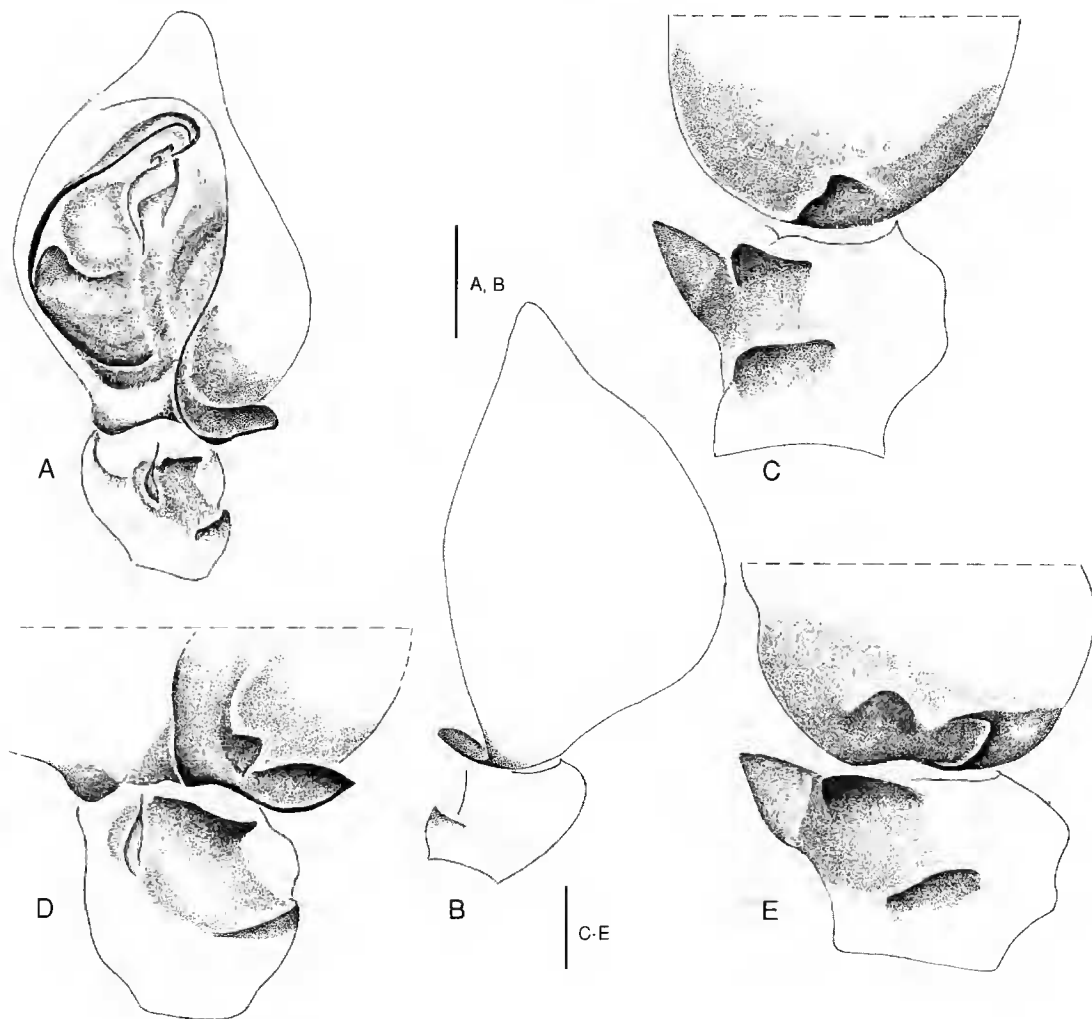


FIG. 10. — *Oxyopes globifer* ♂, left palpus; A, ventral view; B, dorsal view; C, retrolateral view of enlarged tibia and basal part of cymbium lacking a hump, detail; D, ventral view of cymbium with a hump, variation; E, retrolateral view of cymbium with a hump, variation. Scale bars: A, B, 0.25 mm; C-E, 0.1 mm.



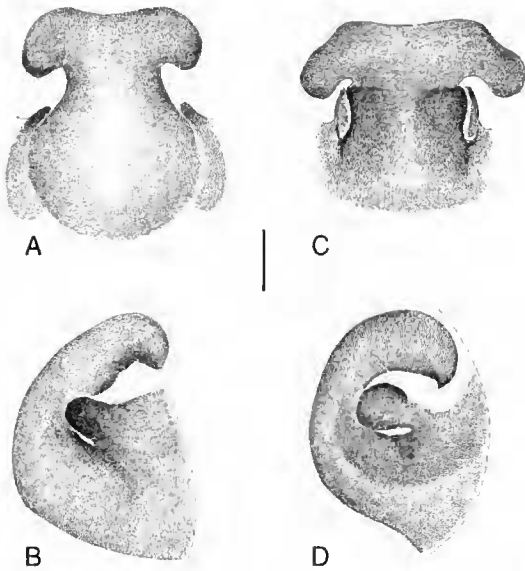


FIG. 11. — *Oxyopes globifer* ♀, epigynum; A, ventral view, common form; B, lateral view, common form; C, ventral view, variation; D, lateral view of another variation. Scale bar: 0.1 mm.

### *Oxyopes globifer* Simon, 1876 (Figs 10-12)

*Oxyopes globifer* Simon, 1876: 222; ♂ holotype from Algeria, cannot be traced, presumably among specimens determined by E. Simon (MNHN, B 2268), specimens from Algeria, Tunisia and Egypt, examined). — Bonnet 1958: 3228. — Barrientos 1984: 155, fig. 4a-b, ♀ and ♂ from Cartagena, Spain.

*Oxyopes attica* Hadjissarantos, 1940: 42, fig. 12, ♂ from Attiki, Greece; type presumably lost. — Brignoli 1978b: 501, fig. 68, ♂ from Turkey; misidentification according to illustration; syn.n.

*Oxyopes maracandensis* Charitonov, 1946: 23, figs 24, 25, ♂ ♀ from Uzbekistan; type not available. — Andreeva & Tyshenko 1969: 224, fig. 7e, ♂ (Tadzhikistan). — Mikhailov & Fer 1986: 182, fig. 3a h (ZMUM, ♂ and ♀ from Turkmenia and Kazakhstan; examined); misidentification; syn.n.

*Oxyopes eymiri* Karol, 1967: 2, figs 1, 2, 3a ♀ from Eymir Lake, Ankara, Turkey; type cannot be traced; misidentification according to illustration; (not ♂ *O. eymiri* Brignoli 1978b: 501, fig. 67); syn.n.

**DIAGNOSIS.** — *Oxyopes globifer* differs distinctly from all other *Oxyopes* species by the male palpus with the peculiar spoon-shaped expansion of the cymbium combined with the form of the sclerites and tibial apophyses, and by the strong laterally extending median structure of the epigynal plate of the female.

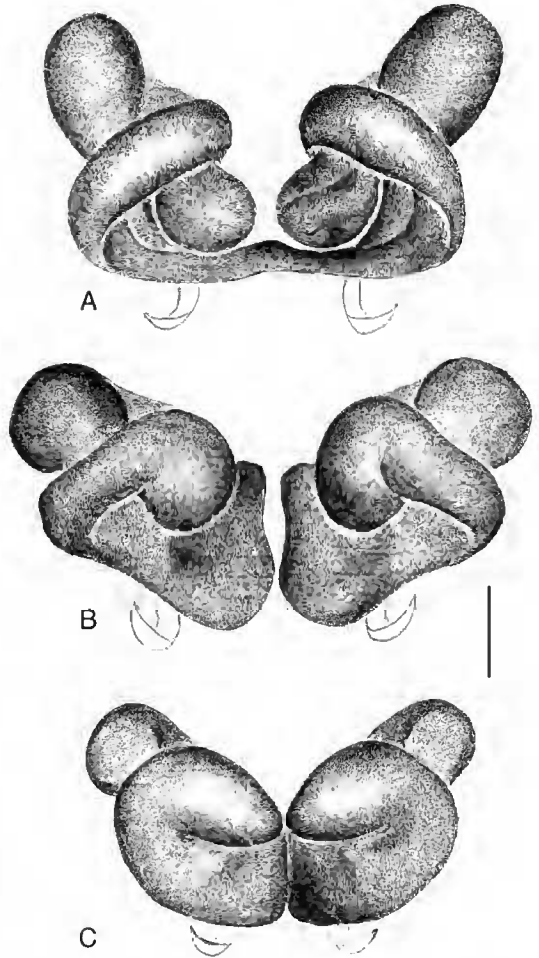


FIG. 12. — *Oxyopes globifer* ♀, spermathecae, dorsal, inner view; A, common form; B, variation; C, additional variation. Scale bar: 0.1 mm.

**DISTRIBUTION.** — Algeria, Tunisia, Libya, Egypt (new record), Southern Spain, Greece, Turkey, Kazakhstan, Turkmenia, Uzbekistan, Tadzhikistan, Israel (new record).

**RECORDS.** — Israel, Peza'el, Jerusalem, Ramat Rahel, Ashdod, En Gedi, Ofaqim, Nahal Sekher (135/053, loess), Be'er Mash'abbim, Shunera sands, Sede Boquer and surroundings, Nahal Hiyyon (154/956), Yotvata. Egypt, Sinai: Mitla Pass (979/939), Suez (February 1889; Simon det.; MNHN, B. 2268 n° 12133; examined).

## DESCRIPTION

*Male*

Measurements (10 ♂♂): total length 3.7-5.2; carapace length 1.8-2.7, width 1.4-2.1, index 1.29-1.38; clypeus index 3.33-4.78; MOQ/cly ratio 1.67-2.14; PM index 1.4-2.0; leg lengths: I 6.7-11.3, II 6.1-10.4, III 5.0-8.0, IV 6.3-10.3; patella-tibia index 1.18-1.45.

**Palpus.** Relatively small. Cymbium basally with marked spoon-like expansion (Fig. 10A, B); shape of concave expansion varies slightly and it may bear a small, rounded brown hump on its surface (Fig. 10A, C-E); centre of bulbus taken by large, white distended mass, a transparent, mesal membrane and an elongated regular outgrowth (Fig. 10A).

*Female*

Measurements (9 ♀♀): total length 4.7-9.0; carapace length 2.3-3.8, width 1.7-2.7, index

1.29-1.41; clypeus index 4.50-6.15; MOQ/cly ratio 1.43-1.82; PM index 1.4-2.3; leg lengths: I 7.6-12.6, II 7.2-11.8, III 5.8-9.8, IV 7.4-12.1; patella-tibia index 1.08-1.35.

**Epigynum.** Brown or yellow-opaque, large, broad and partly constricted median structure extends sideways on upper edges with marked expansions (Fig. 11A, C); median structure bends strongly inwards (best viewed in profile, Fig. 11B, D). Black tubes of spermathecae usually curve on themselves; winding coils rather distinct (Fig. 12A) or outlines of compact bodies barely visible (Fig. 12B, C).

## COMMENTS

Adult males were collected in Israel in January and from April to July, and adult females from April to September. Both sexes, occasionally, were found in pitfall traps. A female with an egg-

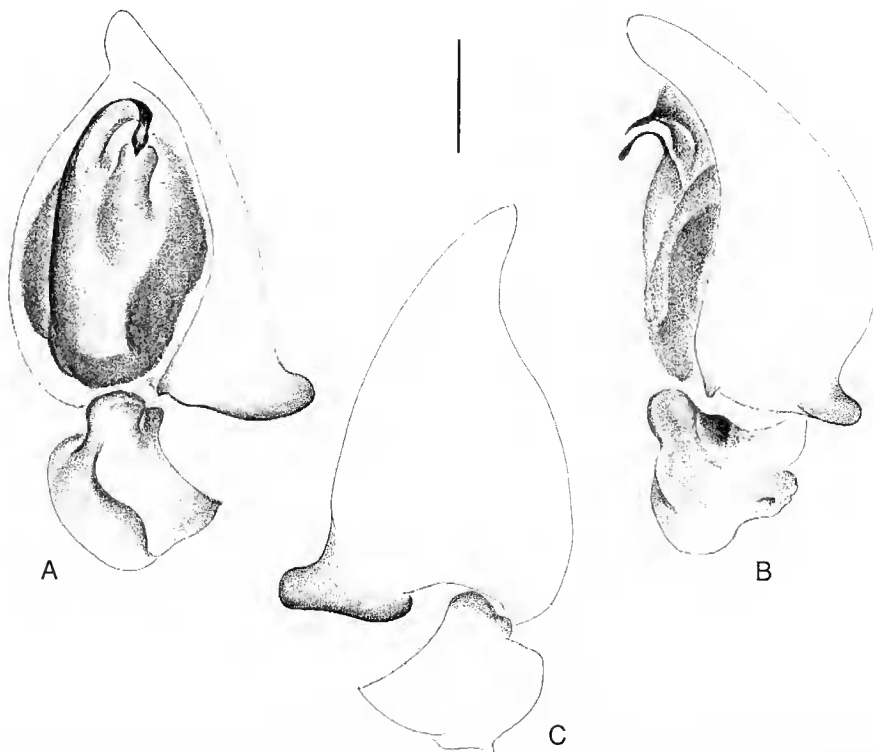


FIG. 13. — *Oxyopes dubourgi* ♂ from Sudan, holotype, left palpus; A, ventral view; B, retrolateral view; C, dorsal view. Scale bar: 0.25 mm.

sac attached to a twig was taken in May. Noteworthy is a superficial resemblance of the expanded cymbium of the male palpus in *O. globifer* with that of *O. dubourgi* Simon, 1904 from the Nile basin, Sudan (♂ holotype, Fig. 13A-C; MNHN, B. 2264). Also should be noted that in local populations a slight variation is encountered regarding the prominence or reduction in size of a little hump on the cymbial expansion of the male palpus. The course of the winding of the spermathecal tubes in the females varies slightly too, but there is no correlation between the sexes considering these variations and no different subspecies can be recognized here.

***Oxyopes mediterraneus* n.sp.**  
(Figs 14, 15)

*Oxyopes pigmentatus* Reimoser, 1913: 506; ♀ from Göi Baschi, possibly near Raqqa, North Syria (NMW; examined); misidentification.

*Oxyopes candidus* Hadjissarantos, 1940: 43, fig. 14a-b ♂; not *candidus* L. Koch (= *O. ramosus*).

*Oxyopes* sp. — Barrientos 1984: 155, fig. 3 ♂.

**HOLOTYPE.** — Adult ♂ from Hatira ridge, near Sede Boqer, Israel, 24.IV.1991 (HUJ 15149), ♀ paratype from the same locality, 21.V.1992 (HUJ 15150); pit-fall traps, Y. Lubin.

**ETYMOLOGY.** — The specific name refers to the typical landscape of this species.

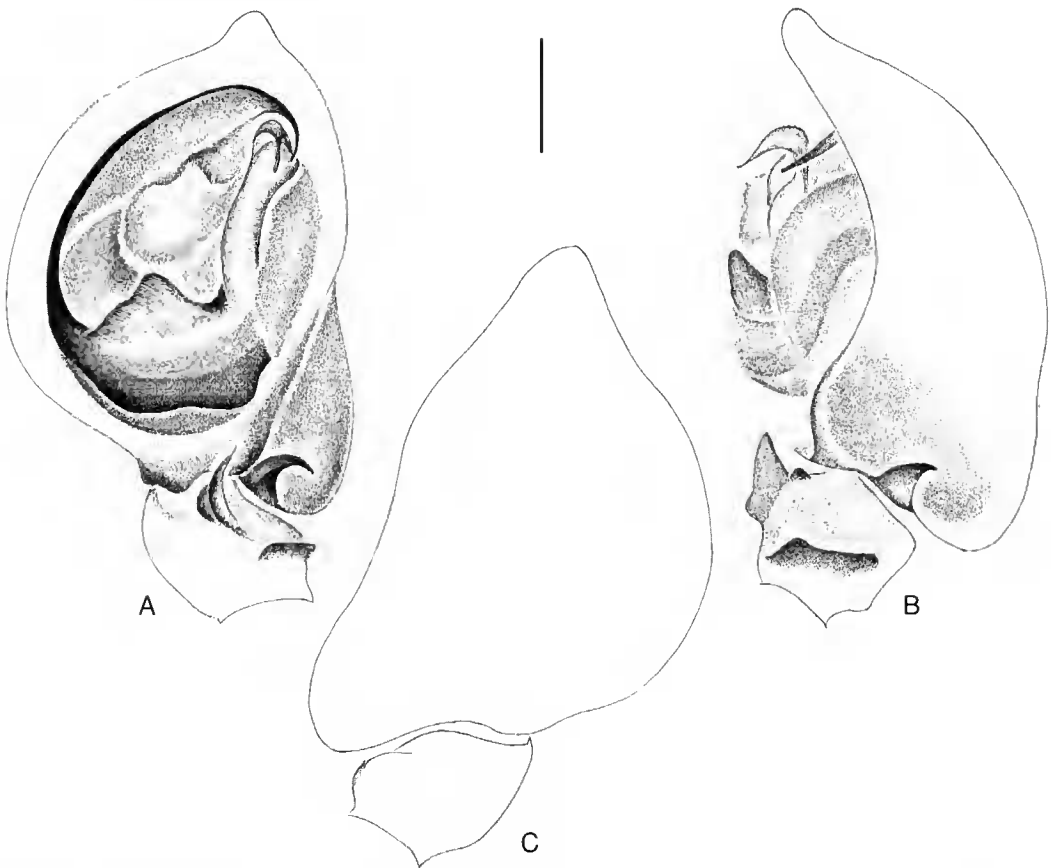


FIG. 14. — *Oxyopes mediterraneus* n.sp. ♂, holotype, left palpus; A, ventral view; B, retrolateral view; C, dorsal view. Scale bar: 0.25 mm.

**DIAGNOSIS.** — *Oxyopes mediterraneus* resembles *O. globifer* closely but differs distinctly by the configuration of the regular sclerites and the shape of the black spine on the cymbium of the male palpus, and by the peculiar shape of the external protrusion on the epigynal plate of the female.

**DISTRIBUTION.** — Morocco, Spain (Barrientos 1984: 157), Greece (Hadjissarantos 1940), North Syria, Israel.

**RECORDS.** — Israel, Ofaqim, Arad, Nahal Sekher (132/058, sands), Be'er Mash'abbim, Yeroham, Sede Boqer and surroundings, Ma'ale Ramon, Ma'agurat (Bor) Loz (112/991).

## DESCRIPTION

### Male

Measurements (of holotype + 10 ♂♂; holotype listed first): total length 5.0, 4.9-5.8; carapace length 2.5, 2.4-3.2, width 1.9, 1.9-2.3, index 1.32, 1.24-1.39; clypeus index 4.18, 4.17-5.09; MOQ/cly ratio 1.74, 1.59-1.72; PM index 1.7, 1.5-1.9; leg lengths: I 9.4, 9.5-12.6, II 8.6, 8.7-11.3, III 6.6, 6.6-8.6, IV 8.5, 8.6-11.5; patella-tibia index 1.24, 1.26-1.37.

**Palpus.** Medium sized, Cymbium basally with concave, ectal extension armed with strong, pointed and inclined black process (Fig. 14A-C); regulum bears long, fleshy, white outgrowth bordered basally by brown membranous lamella and medially by white distended mass (Fig. 14A).

### Female

Measurements (10 ♀♀): total length 6.0-7.7; carapace length 2.8-3.4, width 2.0-2.5, index 1.29-1.40; clypeus index 4.67-5.83; MOQ/cly ratio 1.43-1.70; PM index 1.6-1.9; leg lengths: I 9.7-11.5, II 8.8-11.3, III 7.0-8.8, IV 9.2-11.5; patella-tibia index 1.09-1.21.

**Epigynum.** Small, tongue-like, narrow and sclerotic median protrusion notched at middle on upper edges (Fig. 15A); notch often turns into deep median split; median protrusion bends inwards slightly and occasionally breaks off (Fig. 15B). Coils of spermathecae as in *O. globifer* (Fig. 12A).

## COMMENTS

Adult males were collected in Israel from March to July and females from April to August. *Oxyopes mediterraneus* is sympatric with *O. globifer* and both were found together in pitfall traps. *Oxyopes mediterraneus*, however, is much more abundant. Despite the similarity of the inner spermathecae in the females of both species, the two sexes of each species can be easily separated by their external genitalic features.

### *Oxyopes pigmentatus* Simon, 1890 (Figs 16, 17)

*Oxyopes pigmentatus* Simon, 1890: 114; syntypes, ♂ + 4 ♀♀ from Sheikh Othman-Aden, Yemen (MNHN, B. 2276, n° 10771; examined). Nor Sherriffs, 1955: 299, figs 12, 13 ♂♀, considering his illustrations.

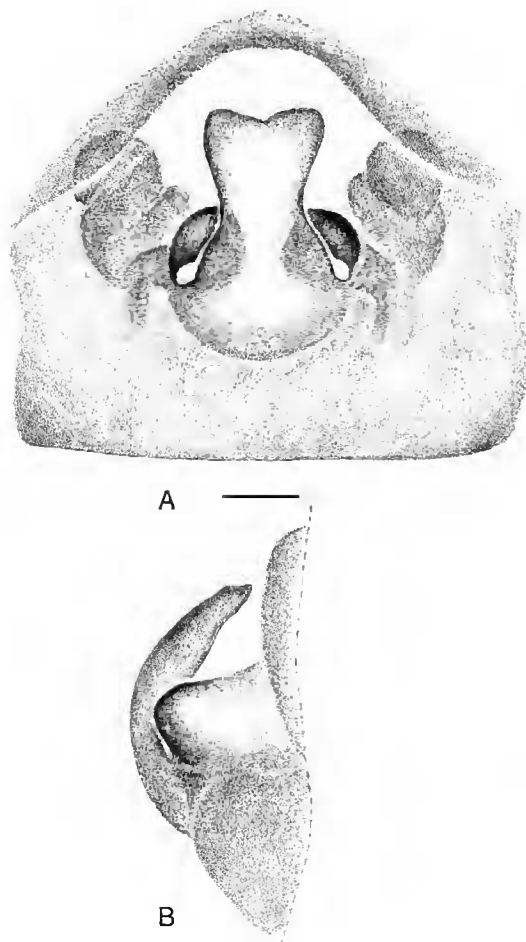


FIG. 15. — *Oxyopes mediterraneus* n.sp. ♀, paratype, epigynum; A, ventral view; B, lateral view. Scale bar: 0.1 mm.

**DIAGNOSIS.** — The male palpus with the four tibial apophyses combined with the form of the tegular outgrowth and the embolar trajectory, and the female epigynum with the unique transversal band and the peculiar inner spermathecae are diagnostic characters that distinguish *O. pigmentatus* easily from all other *Oxyopes* species.

**DISTRIBUTION.** — Yemen, Israel, new record.

**RECORDS.** — Israel, Kallia, Be'er Mash'abbim.

#### DESCRIPTION

##### Male

Measurements (2 ♂♂): total length 4.7-5.8; carapace length 2.5-2.8, width 1.8-2.1, index

1.33-1.39; clypeus index 3.30-3.63; MOQ/cly ratio 2.38-2.67; PM index 1.7-2.0; leg lengths: I 10.8-12.3, II 9.4-10.8, III 6.7-8.3, IV 9.2-10.2; patella-tibia index 1.40-1.43.

**Palpus.** Relatively small. Bulbus basally traversed by broad embolus tapering along mesal side and bending apically (Fig. 16A); fine whitish outgrowth rises at upper part of tegulum. Tibia bears apically two light, membranous protuberances and in the middle two blackish, pointed small apophyses (Fig. 16A-C).

##### Female

Note: no adult female was as yet collected in

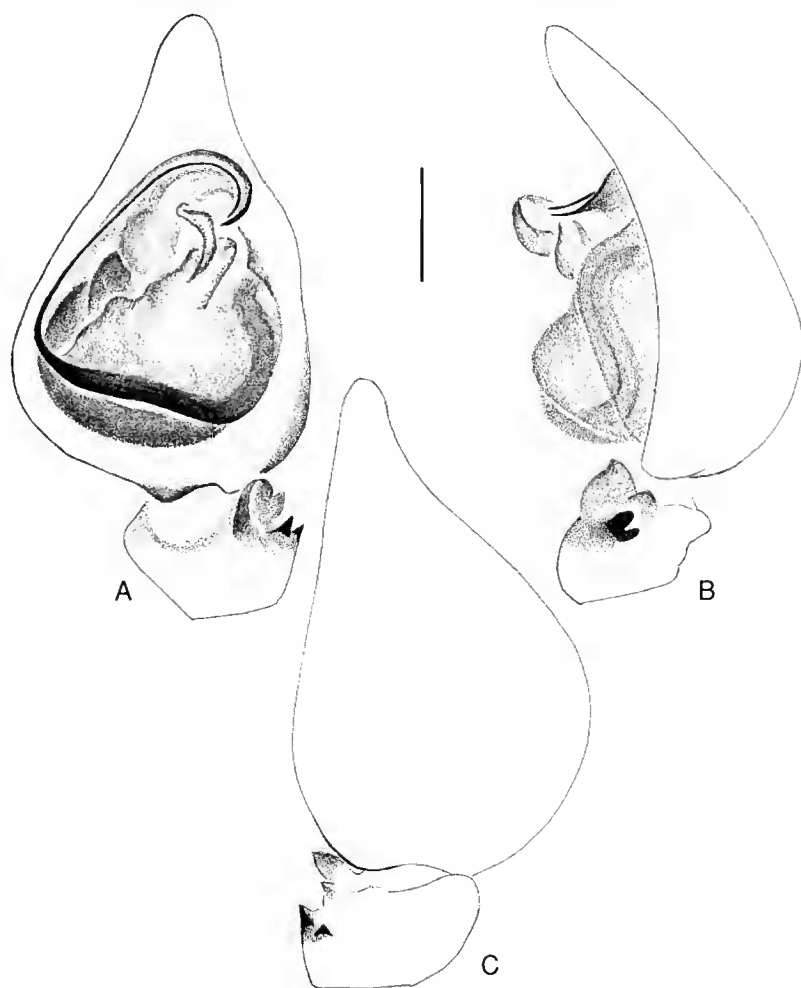


FIG. 16. — *Oxyopes pigmentatus* ♂, left palpus; A, ventral view; B, retrolateral view; C, dorsal view. Scale bar: 0.25 mm.

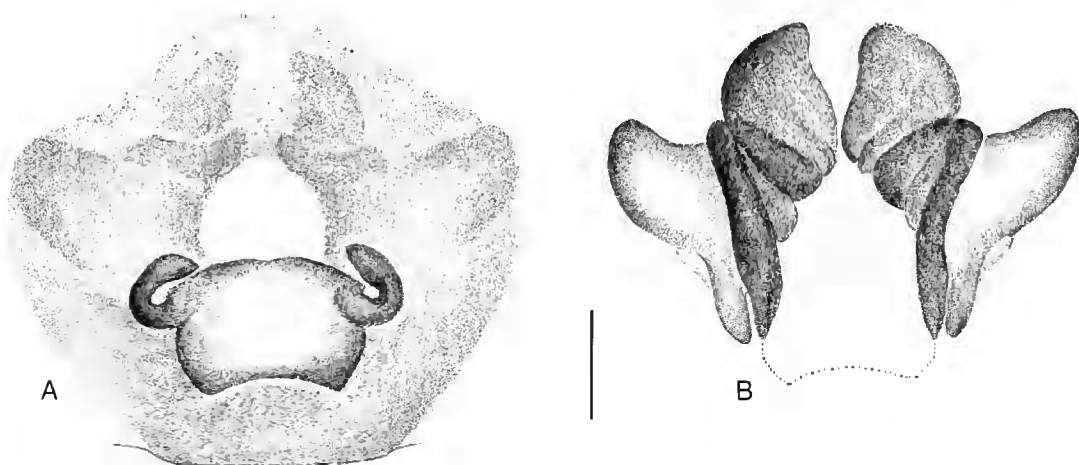


FIG. 17. — *Oxyopes pigmentatus* ♀ from Aden, syntype; A, epigynum, ventral view; B, spermathecae, dorsal, inner view. Scale bar: 0.1 mm.

Israel and drawings provided are of a syntype from Aden.

**Epigynum.** Elevated transversal, sclerotic and transparent brown band, borders light central depression (Fig. 17A); curved deep-red extensions rise on upper corners of transversal band. Relatively large spermatheca consists of a partly coiled red-brown median body and a light-brown lateral lobe (Fig. 17B).

#### COMMENTS

Simon (1890) reports finding *O. pigmentatus* in Yemen on Sea-blile (*Sueda*) shrubs, a plant with species growing also in Israel. The two adult males collected thus far in Israel were found in July in the hottest sites of this country: along the Dead Sea and in the sand dunes of the Negev. Reimoser's (1913) record of *pigmentatus* from Mesopotamia proved to be *O. mediterraneus* n.sp. (see above). Comparing the syntypes of *O. pigmentatus* with the incompatible illustrations in Sherriffs (1955) there apparently has been some misplacement. Also his presentation of an adult female of *O. rutilius* Simon, 1890 from Aden (Sherriffs 1955: 302, fig. 19) is questionable considering that Simon (1890: 114) described only very young, unidentifiable specimens (MNHN, B. 2276, n° 10772; 5 immature syntypes, examined).

#### *Oxyopes badhyzicus* Mikhailov et Fet, 1986 (Figs 18, 19)

*Oxyopes badhyzicus* Mikhailov et Fet, 1986: 183, figs 3b-d, ♂ ♀; ♂ holotype and ♀ ♀ paratypes from Badhyz Desert, Turkmenia (ZMUM, Ta-3567, Ta-3568; examined).

**DIAGNOSIS.** — *Oxyopes badhyzicus* differs distinctly from all other *Oxyopes* species by the male palpus with the peculiar expansions of the tegular outgrowth, the form of the embolar tip and the shape of the tibial apophyses, and by the extraordinary form of the epigynal plate of the female.

**DISTRIBUTION.** — Turkmenia, Israel, new record.

**RECORDS.** — Israel, Palmahim, Ben Zakkay, Lahav, Ofaqim, Nahal Sekher, Revivim, Be'er Mash'abbim, Sede Boqer and surroundings.

#### DESCRIPTION

##### Male

Measurements (10 ♂ ♂): total length 4.3-6.2; carapace length 2.0-2.7, width 1.5-2.2, index 1.25-1.33; clypeus index 3.27-4.54; MOQ/cly ratio 1.50-1.92; PM index 1.5-1.8; leg lengths: I 8.6-12.0, II 7.9-11.2, III 4.9-6.5, IV 8.5-11.8; patella-tibia index 1.32-1.46.

**Palpus.** Thick, black terminal portion of embolus curves on itself apically (Fig. 18A, B); whitish outgrowth of tegulum expands into extensions

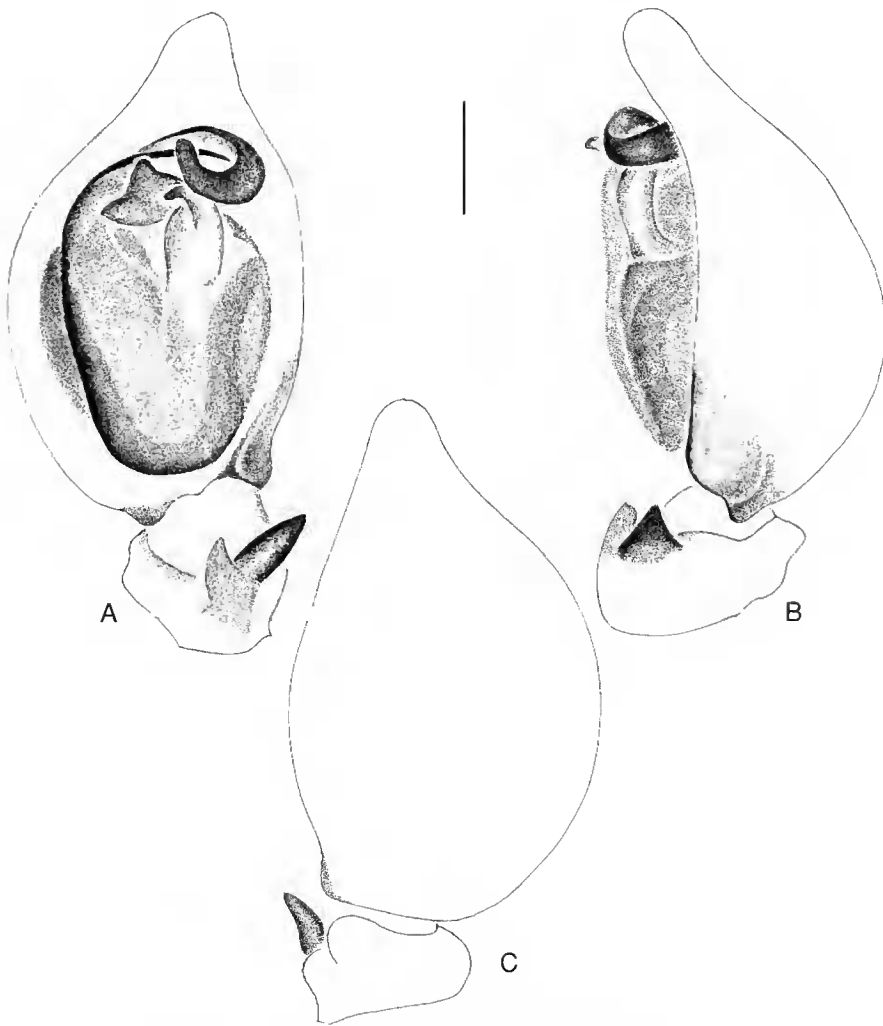


FIG. 18. — *Oxyopes badhyzicus* ♂, left palp; A, ventral view; B, retrolateral view; C, dorsal view. Scale bar: 0.25 mm.

resting below embolar tip (Fig. 18A, B). Tibia armed with a black coned apophysis and a light membranous one rising from a common base (Fig. 18A-C).

#### Female

Measurements (6 ♀♀): total length 7.2-8.6; carapace length 2.6-3.2, width 2.0-2.5, index 1.20-1.39; clypeus index 4.62-5.0; MOQ/cly ratio 1.41-1.57; PM index 1.7-2.2; leg lengths: I 9.3-10.9, II 8.9-10.6, III 5.7-7.0, IV 9.7-11.9; patella-tibia index 1.11-1.20.

**Epigynum.** Relatively large. Central depression

divided by a distinct median septum into two cavities bordered on upper sides by thick black rims (Fig. 19A). Spermathecae form large brownish bodies with thick, inwards bent, black extensions (Fig. 19B).

#### COMMENTS

Only a few females have been collected whereas males with their rather delicate body have often been taken by pitfall traps. Adult males are found from April to September and females from May to December.

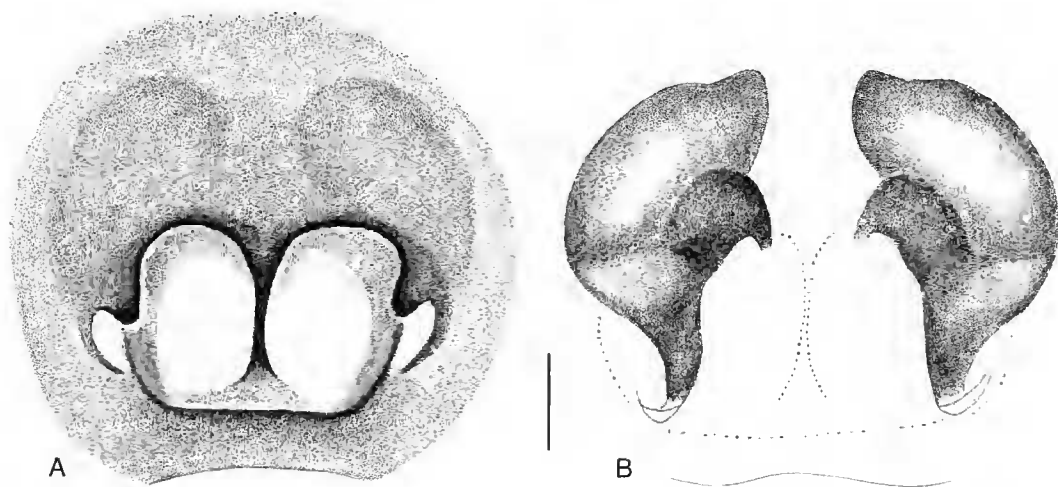


FIG. 19. — *Oxyopes badhyzicus* ♀: A, epigynum, ventral view; B, spermathecae, dorsal, inner view. Scale bar: 0.1 mm.

### Genus *Peucetia* Thorell, 1869

TYPE SPECIES. — *Pasithea viridis* Blackwall, 1858; preoccupied name of genus replaced by Thorell 1869: 37 (see Bonnet 1958: 3438).

#### DESCRIPTION

Bright green or yellowish spiders often tinged with red and white streaks. Medium to large sized, 8 to over 20 mm in body length. Carapace longer than wide, narrow in front, with distinct fovea (Fig. 20A); clypeus often with dark markings running down also along chelicerae. Anterior row of eyes strongly recurved with anterior-laterals largest of all eyes and anterior-medians clearly the smallest (Fig. 20B, C). Posterior row of eyes slightly procurved with eyes about the same size and subequally placed. Distance between anterior-lateral eyes 1.4–1.6 times longer than space between posterior-medial eyes (view trapeze outlined, Fig. 20B). Labium elongated and greatly exceeded in length by the very long palpal endites (Fig. 20D). Chelicerae have a very long basal segment, short fang and no teeth. Legs relatively long; legs formula: I, II, IV, III. Opisthosoma elongated, often uniformly coloured or with pattern of chevrons, sometimes with a continuous mid-dorsal mark. The green colour fades completely on preserva-

tion in alcohol. Male palpus bears a long, side-wards projecting, slightly concave, median apophysis and a peculiar retrolateral paracymbial sclerite (Figs 22A, B, 24A, B); segments of male palpus often long and slender with tibia sometimes appreciably longer than tarsal (bulbar) portion (Fig. 21). Female epigynum usually consists of central depression bordered by variously shaped projections or plate bearing diverse humps and prominences (Figs 23A, 25A, 27A).

#### REMARKS

*Peucetia* comprises plant-dwelling spiders often found on shrub-like glandular plants e.g. *Ononis* or *Cleome* in Israel as well as in southern Spain or Yemen (Simon 1890: 113; Barrientos 1991: 91). They are agile spiders with quick, darting movements. Knowledge on the biology of *Peucetia* is based primarily on studies of the North American *P. viridans* (Hentz, 1845) corroborated by rather fragmentary observations on some congeners from other parts of the world (for references, see Van Niekerk & Dippenaar-Schoeman 1994).

*Peucetia* spiders build no snares but make use of silk by trailing a dragline when dropping on prey or while hanging inverted from silk threads awaiting to sweep in with their legs, moths or wasps



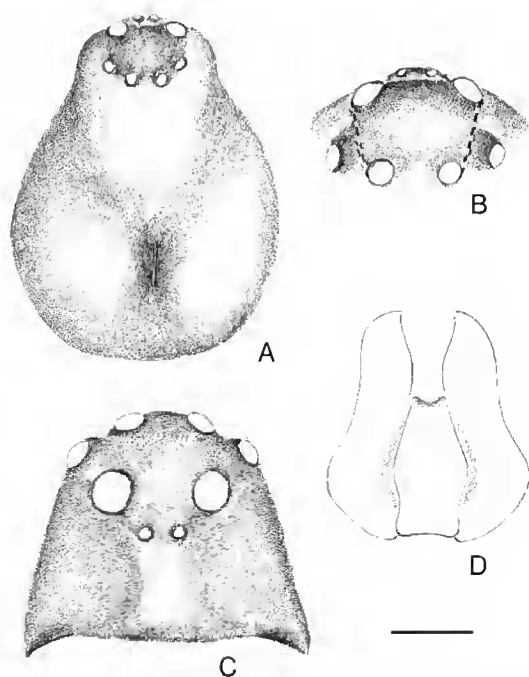


FIG. 20. — *Peucetia*: A, carapace, dorsal view; B, eye arrangement, dorsal view, detail; characteristic trapeze outlined; C, eye arrangement, frontal view; D, labium and palpal endites. Scale bar: A, 1 mm; B-D, 0.5 mm.

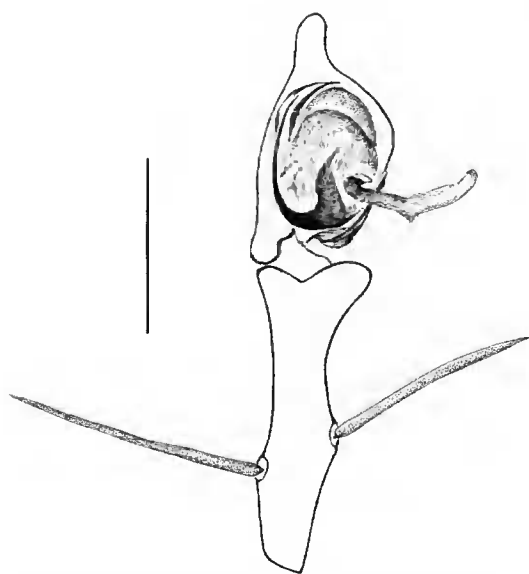


FIG. 21. — *Peucetia* ♂, tibia and bulb of left palpus; view of common proportions and tibial bristles. Scale bar: 1 mm.

flying under them (Rovner 1980). Their mating behaviour also involves silk as both male and female are suspended on threads, inverted with their venters facing each other (Whitcomb & Eason 1965). The egg-sac is suspended by silk lines attached to nearby twigs and guarded continuously, presumably mainly from ants, by the female hanging upside down from it. The spider may relocate the egg-sac to a new place in response to disturbances, by sequentially attaching and detaching lines, but it never actually carries the sac (Fink 1987). Spitting of a liquid from the spread chelicerae by the female of *P. viridans* when disturbed has been described, but it apparently is never used against conspecifics or ants (Fink 1984). The female remains with the egg-sac until after the spiderlings have emerged. These stay close to the egg-sac for a few days and then disperse. The young construct a small, irregular foothold-web on which they rest or hang in inverted position (Kaston 1972). *Peucetia viridans* is reported to prey primarily on flying insects: bees and wasps, flies and moths of different families (Whitcomb *et al.* 1963; Randall 1982). Feeding on lepidopteran larvae, although common in *Peucetia*'s habitat, was not observed (Turner 1979: 151). *Peucetia* may sweep in prey both day and night (Rovner 1980).

Nearly sixty species of *Peucetia* are known at present from throughout the world, mainly from the tropics of America, Africa and to a lesser extent from warmer parts of the Oriental and Palearctic regions. Only two species are known from North America and one from southern Europe, whereas three species are reported here from Israel. Two of the latter have never before been recorded from Israel.

***Peucetia virescens* (O. P.-Cambridge, 1872)**  
(Figs 22, 23)

*Pasitheia virescens* O. P.-Cambridge, 1872: 314; syn-types, 2 immature specimens from Jerusalem, Israel (HECO, B.820, t.3; examined); attributable to the sole species occurring in Jerusalem).

*Peucetia virescens* — Simon 1876: 222; 1882: 217, adult ♀ from "Syria"; 1884: 183, adult ♂ and ♀ from close to Beirut, Lebanon (MNHN; not examined). — Van Niekerk & Dippenaar-Schoeman 1994: 46, fig. 15 ♀.

**DIAGNOSIS.** — The combination of the low tegular ridge, smooth cymbial notch and the shape of the paracymbium of the male palpus, and the peculiar form of the epigynal protuberances and the spermathecae of the female are all diagnostic characters that distinctly separate *P. virescens* from all other *Peucetia* species.

**DISTRIBUTION.** — Israel, Lebanon, Jordan (Gerash; Pavesi 1895: 8), Egypt (Dakhla Oasis; Van Niekerk & Dippenaar-Schoeman 1994: 48), Libya (Fezzan; Caporiacco 1936b: 7).

**RECORDS.** — Israel, Newe Ya'aqov, Jerusalem, Ma'ale Adummim.

# DESCRIPTION

## Male

Measurements (3 ♂♂): total length 7.8-8.0; carapace length 3.7-4.1, width 3.0-3.1, index 1.23-1.32; clypeus index 3.8-4.4; MOQ/cly ratio 1.96-2.0; PM index 1.05-1.29; leg lengths: I 19.2-22.9, II 16.8-19.4, III 13.4-15.7, IV 15.0-17.4; patella-tibia index 1.62-1.71.

**Palpus.** Elongated tibia, longer than bulbus, armed with two long bristles. Bulbus apically with low tegular ridge (TR; Fig. 22A); long median apophysis (M) with small process protruding from lower side of shaft (Fig. 22A, B); basal retrolateral notch (N) on cymbium with smooth edges, exposing blackish, relatively small paracymbium (P; Fig. 22B).

## Female

Measurements (8 ♀♀): total length 11.1-12.9; carapace length 4.2-5.0, width 3.1-3.7, index 1.32-1.39; clypeus index 5.07-6.0; MOQ/cly ratio 1.27-1.47; PM index 0.75-1.0; leg lengths: I 16.2-20.2, II 14.3-18.1, III 12.1-15.6, IV 13.5-17.4; patella-tibia index 1.18-1.43.

**Epigynum.** Globular swellings separated by deep median furrow tapering anteriorly into widened depression (Fig. 23A); swellings with dark, partly truncated edges extend over openings on ectal sides (Fig. 23A); openings, narrow, slit-like on posterior view (Fig. 23B). Spermathecae (Fig. 23C).

# COMMENTS

The male is illustrated here for the first time. Remnants of broken shafts of the paracymbial

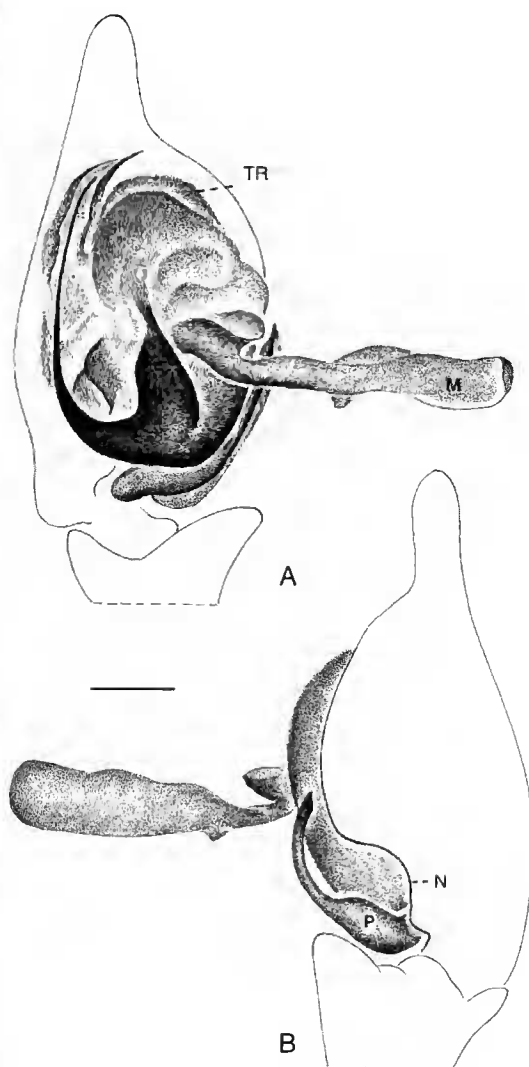


FIG. 22. — *Peucetia virescens* ♂, left palpus; A, ventral view; B, retrolateral view. Abbreviations: M, median apophysis; N, cymbial notch; P, paracymbium; TR, tegular ridge. Scale bar, 0.25 mm.

sclerite of the male palpus are often found stuck inside the openings on the female epigynum. Adult males were collected in May and July and adult females from March to July. A female with an egg-sac was taken in June. The occurrence of *P. virescens* in relatively mesic habitats, e.g. Beirut in Lebanon and north of Jerusalem as well as in xeric sites like Ma'ale Adummim is unparalleled

*Peucetia arabica* Simon, 1882

(Figs 20, 21, 24, 25)

*Peucetia arabica* Simon, 1882: 216; ♂♂ and ♀♀ syntypes from Aden (MNHN, B, 2250, n° 4203; examined). — Roewer 1954a: 334. — Bonnet 1958: 3488. — Van Niekerk & Dippenaar-Schoeman 1994: 45, fig. 15g-k.

**DIAGNOSIS.** — *Peucetia arabica* resembles *P. virescens* very closely and can be distinguished by the high tegular ridge of the male palpus and fine details of the paracymbium, and by the peculiar shape of the swellings on the epigynum of the female with their lateral extensions.

**DISTRIBUTION.** — Aden (Simon 1882), Yemen (Hodeida, Gebel Milhan; Simon 1890: 113; Hadhramaut; Pocock 1895), Perim Island (Simon 1890: 123), Ethiopia (Pavesi 1897; Simon 1904), Sudan (Omdurman; Simon 1907; Khartoum; Van Niekerk & Dippenaar-Schoeman 1994), Libya (El-Auenat; Caporiacco 1936a: 118; Van Niekerk & Dippenaar-Schoeman 1994), Morocco (Jocqué 1977: 335), Egypt (Gebel Ataka; Simon 1890; Cairo; Simon 1907; Siwa Oasis; Denis 1947; Sinai — new record), Israel — new record, presumably Jordan and Saudi Arabia.

**RECORDS.** — Israel, Ma'ale Shalem, En Gedi, Miz'pe Groffit, Eilat. Egypt-Sinai: St Catherine's Monastery and surroundings (049/775), Wadi Isla (040/742), Wadi Beda (080/730), Sharm e-Shikh (080/696).

**DESCRIPTION***Male*

Measurements (5 ♂♂): total length 6.7-8.8; carapace length 3.2-4.2, width 2.6-3.3, index 1.23-1.31; clypeus index 3.4-4.5; MOQ/cly ratio 1.92-2.35; PM index 0.72-1.0; leg lengths: I 18.4-22.2, II 15.6-18.9, III 12.8-15.8, IV 15.0-17.9; patella-tibia index 1.57-1.68.

**Palpus.** Tibia longer than bulbus bears two long, thick bristles. Bulbus apically with high, raised regular ridge (Fig. 24A); median apophysis with rather distinct process protruding from lower side of shaft (Fig. 24A, B); basal retrolateral notch of cymbium often with lobe-like, brown expansion (Fig. 24B); paracymbium relatively large.

*Female*

Measurements (10 ♀♀): total length 9.5-13.0; carapace length 4.8-6.0, width 3.4-4.3, index

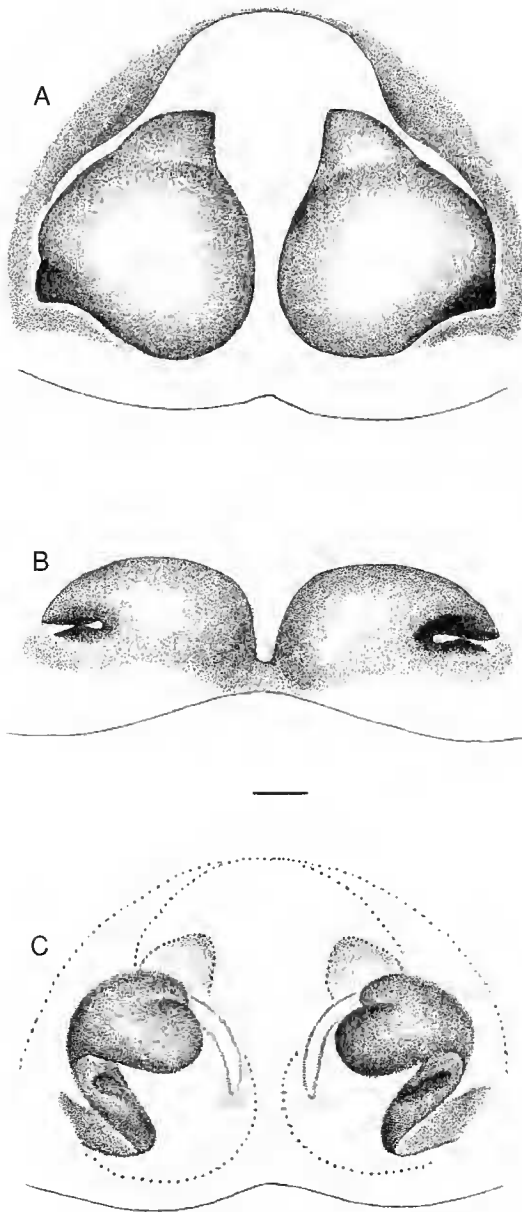


FIG. 23. — *Peucetia virescens* ♀; **A**, epigynum, ventral view; **B**, epigynum, posterior view; **C**, spermathecae, dorsal, inner view. Scale bar: 0.1 mm.

by other *Peucetia* of this region which are found only in semi-eremic or arid habitats. The listing of Arabia by Reimoser (1919: 159), copied repeatedly thereafter, is unfounded and should be newly corroborated.

1.29-1.44; clypeus index 5.36-7.34; MOQ/cly ratio 1.05-1.20; PM index 0.66-1.0; leg lengths: I 17.6-21.6, II 15.4-20.0, III 13.5-17.6, IV 15.3-19.6; patella-tibia index 1.25-1.34.

**Epigynum.** Large bulbous swellings distinctly separated medially and declining gradually anteriorly below edges of relatively narrow depression (Fig. 25A); posterior part of each swelling expanding ectally into spur-like, blackish extension

(Fig. 25A); openings above lateral extensions bordered by brown, transparent edges guarding orifices; lateral extensions of swellings clearly visible on posterior view (Fig. 25B). Spermathecae (Fig. 25C).

#### COMMENTS

Adults of both sexes have been taken at various months of the year. *Peucetia arabica* is the more

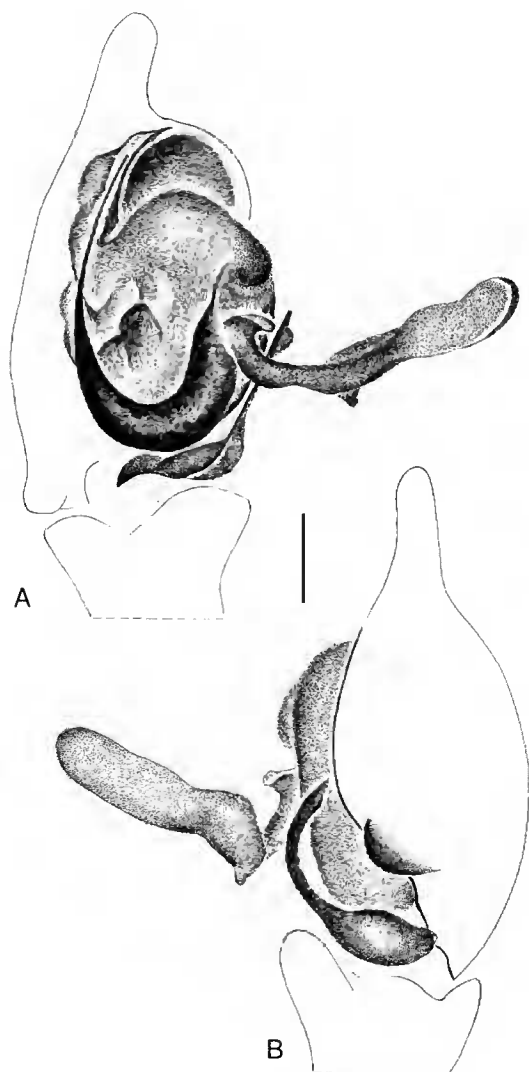


FIG. 24. — *Peucetia arabica* ♂, left palpus; A, ventral view; B, retrolateral view. Scale bar: 0.25 mm.

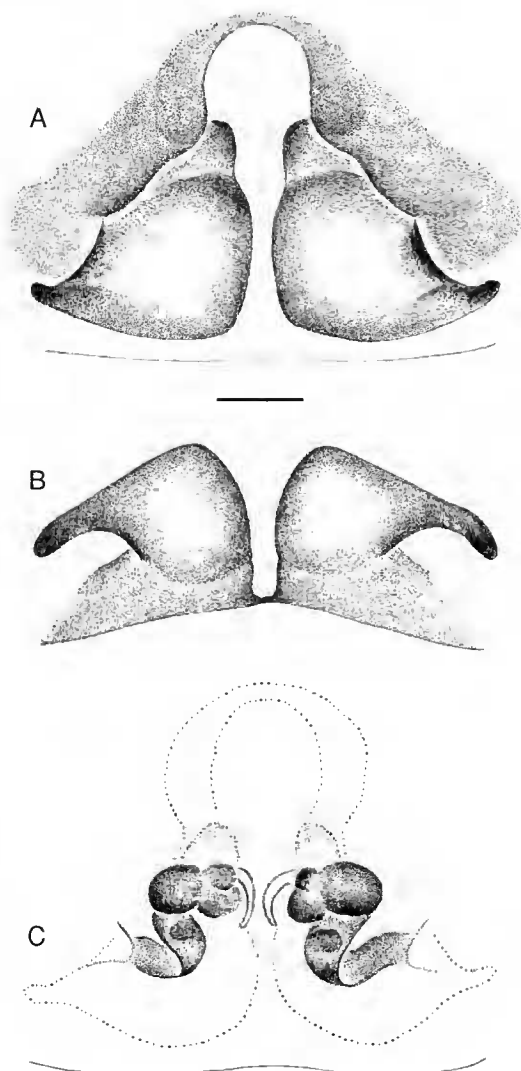


FIG. 25. — *Peucetia arabica* ♀; A, epigynum, ventral view; B, epigynum, posterior view; C, spermathecae, dorsal, inner view. Scale bar: 0.2 mm.

common *Peucetia* of southern Israel. Green or occasionally yellowish specimens are encountered on various species of the sticky *Clome* plants, as formerly indicated for Yemen by Simon (1890: 113; 1898a: 375).

***Peucetia viridis* (Blackwall, 1858)**  
(Figs 26, 27)

*Pasithea viridis* Blackwall, 1858: 428; ♂ holotype from Algiers, Algeria in HECO examined by Van Niekerk & Dippenaar-Schoeman 1994: 27.

*Peucetia viridis* – Thorell 1869: 37. – Roewer 1954a: 335. – Bonnet 1958: 3493. – Denis 1966: 128,

fig. 46. – Barrientos 1991: 83, figs 2, 3. – Van Niekerk & Dippenaar-Schoeman 1994: 27, fig. 9a-k.

**DIAGNOSIS.** — *Peucetia viridis* differs distinctly from all other *Peucetia* species by the peculiar shape of the paracymbial sclerite of the male palpus, and by the form of the genital structures of the female epigynum.

**DISTRIBUTION.** — Spain (along Mediterranean coast, Simon 1898a: 76; Barrientos 1991), Cape Verde Islands (Simon 1897), Algeria (Blackwall 1858), Libya (Denis 1966), Namibia, Botswana, South Africa (Van Niekerk & Dippenaar-Schoeman 1994), Ethiopia (Pavesi 1883), Egypt (Sinai: Gebel Mussa, O. P.-Cambridge 1870: 819), Rhodes (Kattavia, Caporiacco 1929: 237), Israel - new record; presumably Jordan.

**RECORDS.** — Israel, near Jericho.

**DESCRIPTION**

**Male**

Note: no adult male has been collected thus far in Israel, and drawings provided are of a specimen from Cartagena, Spain, determined by E. Simon.

**Palpus.** Tibia longer than bulbus and armed with two long bristles. Bulbus apically with low regular ridge; median apophysis without process on underside of shaft (Fig. 26A); paracymbium relatively large with small protuberances projecting along its apical portion (Fig. 26B).

**Female**

Measurements (2 ♀♀): total length 13.3-14.5; carapace length 5.3-6.3, width 3.7-4.4, index 1.43; clypeus index 7.5-7.8; MOQ/cly ratio 0.92-1.0; PM index 0.76-0.87; leg lengths: I 24.2-28.2, II 20.7-24.9, III 17.1-20.3, IV 20.3-24.4; patella-tibia index 1.52-1.53.

**Epigynum.** Relatively flattened with short finger-like lobes bulging into large anterior depression (Fig. 27A); brown posterior edges of lobes slightly raised above ectal openings, and lobes medially only little depressed (Fig. 27A, B). Spermathecae (Fig. 27C).

**COMMENTS**

Only two adult females were as yet found in Israel, in the rather hot area of Jericho. One was taken in May with an egg-sac, the other in June. These proved identical with numerous specimens

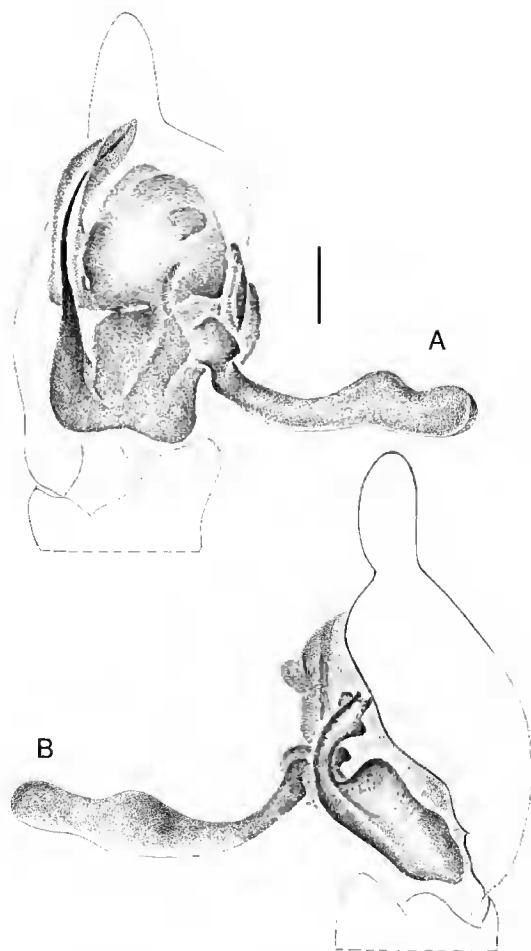


FIG. 26. — *Peucetia viridis* ♂ from Spain, left palpus; A, ventral view; B, retrolateral view. Scale bar: 0.25 mm.

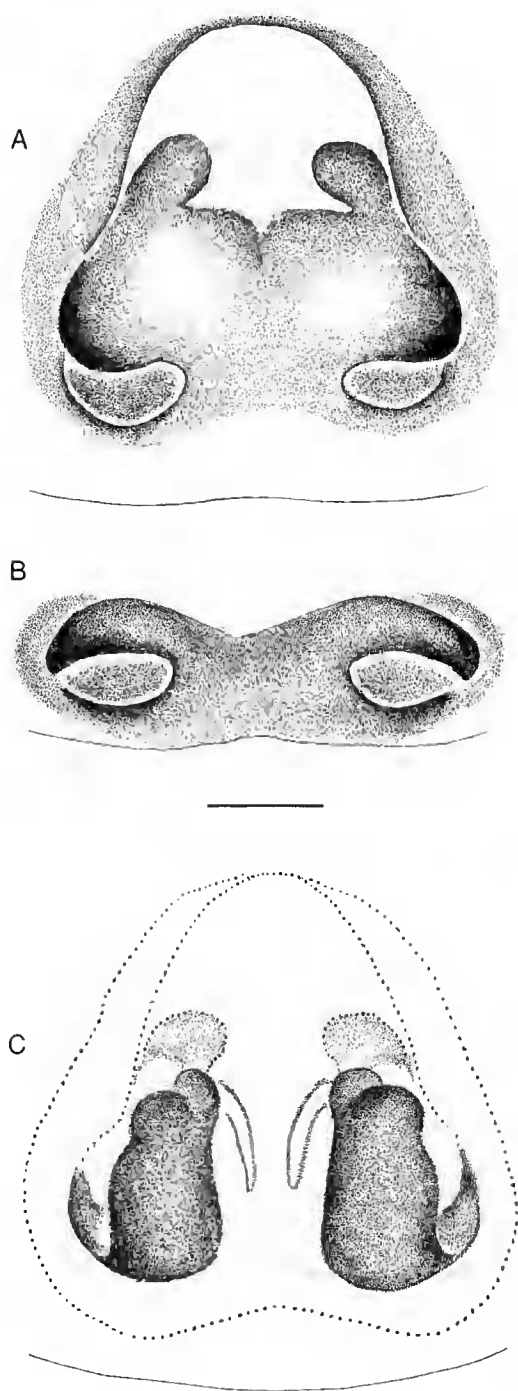


FIG. 27. — *Peuceetia viridis* ♀; A, epigynum, ventral view; B, epigynum, posterior view; C, spermathecae, dorsal, inner view. Scale bar: 0.2 mm.

examined from Spain (Cartagena; MNHN, B. 2255, n° 708). The occurrence in Israel of a species distributed in South Africa is rather exceptional. Apparently *P. viridis* is first and foremost an African species with a northward influx into Spain on one side of the Mediterranean and along Sinai into Israel on the other side. The sole Aegean record from Rhodes, seemingly should be newly authenticated.

#### Family PISAURIDAE Simon, 1898

The nursery-web spiders of Israel are hunters without snares that chase their prey or wait for it clutching at leaves. They are found in wet habitats of grasses and low vegetation, resembling in general the much more abundant wolf-spiders (Lycosidae). The nursery-web, a bell-like web enclosing an egg-sac or new hatchlings, is considered the most characteristic feature of this family. Their eyes are arranged in two rows with the anterior row visible from above and the posterior row strongly recurved in dorsal view. The large chelicerae bear strong teeth on both margins. Their legs are long with trochanters deeply notched and tarsi are armed with three dentated claws. Opisthosoma tapers to a pointed end and bears three pairs of spinnerets but no colulus. Male palpus is armed with a tibial apophysis (absent in lycosids) and the female epigynum is often divided by a median septum. Three pisaurid species are present in Israel, numbering thus as many as in all of western Europe. These belong to two genera: *Pisaura* and *Rothus*. The latter genus is recorded here for the first time from Asia.

#### Genus *Pisaura* Simon, 1885

TYPE SPECIES. — *Araneus mirabilis* Clerck, 1757, designated by Simon (1885: 354).

#### DESCRIPTION

Medium to relatively large spiders, females may reach over 14 mm in body length. Carapace brown to blackish coloured often with a dorsal longitudinal stripe. Body densely covered with setae. Carapace longer than wide with triangular, vertical, rather high clypeus (Fig. 28A, B).

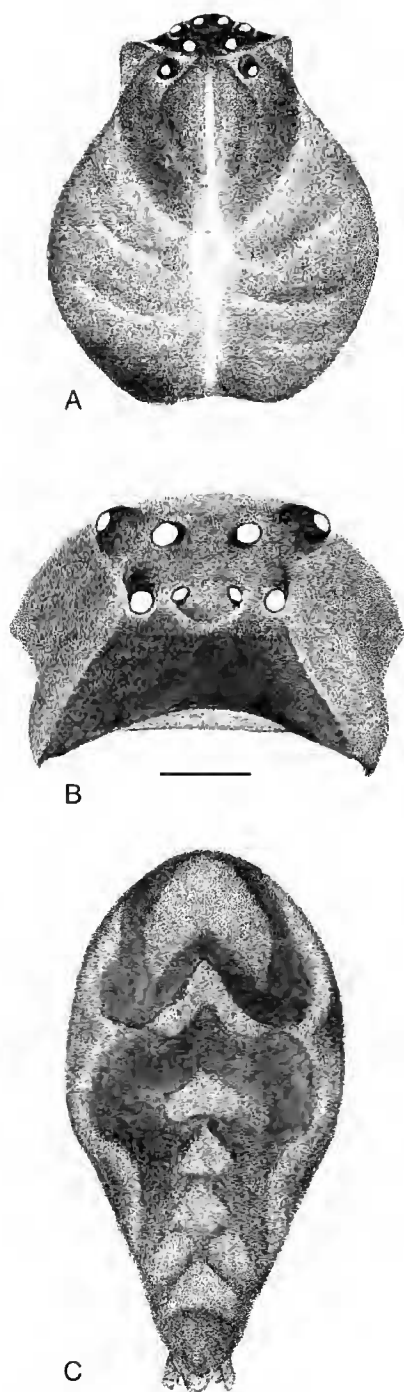


FIG. 28. — *Pisaura*; A, carapace, dorsal view; B, eye arrangement, frontal view; C, opisthosoma, dorsal view. Scale bar: A, C, 1 mm; B, 0.5 mm.

Anterior row of eyes nearly straight or slightly recurved; anterior-median eyes equal or often slightly smaller than anterior-lateral eyes. Posterior eyes larger than anteriors, with the posterior-medians largest of all. Median-ocular-quadrangle posteriorly wider than anteriorly and about 1-1.5 times longer than clypeus height. Labium rebordered, about as long as wide and clearly exceeded in length by endites of palpi. Chelicerae usually with three teeth on each margin. Legs spinose, formula usually: IV, II, I, III. Opisthosoma elongated, dark coloured, with or without a light longitudinal band or with a dorsal pattern (Fig. 28C); the pattern is even intraspecific rather variable. Male palpus with fine, sclerotic retrolateral embolus ensheathed by a conspicuous conductor, a hooked median-apophysis and a prominent distal-apophysis (da of Sierwald 1990; Figs 29A, C, 31A, B). Female epigynum anchor-shaped (Figs 30A-E, 32A).

#### REMARKS

*Pisaura* comprises about a dozen species distributed in the Palearctic and Oriental Regions. These include, regardless of the highly variable epigyna found in exactly the same population, some doubtful species based solely on females allegedly distinguishable from *P. mirabilis* (their males are all alike). There are two sympatric species in Israel and each of the sexes can be easily distinguished.

#### *Pisaura mirabilis* (Clerck, 1757) (Figs 29, 30)

*Araneus mirabilis* Clerck, 1757: 108, pl. 5, fig. 10; ♂ and ♀ syntypes from Sweden, presumably lost.

*Pisaura mirabilis* — Simon 1885: 354. — Palmgren 1943: 7, fig. 2 (as *listeri*). — Roewer 1954a: 119. — Bonnet 1958: 3674. — Azheganova 1968: 22, figs 25, 26. — Loksa 1969: 130, figs 87, 88. — Miller 1971: 170, figs 13, 14. — Blandin 1976: 926, figs 1, 7a, 10, 13, 15, 18. — Brignoli 1977: 63, figs 37-40; 1978a: 204, figs 1, 2. — Platnick 1989: 395; 1993: 521.

DIAGNOSIS. — The shape of the tibial retrolateral apophysis of the male palpus and the form of the conductor and the distal-apophysis are distinctive characters of *P. mirabilis* clearly separating it from all other *Pisaura* species. The females with their great epigynal variation, may however, not always be distinguishable unless accompanied by a male.

DISTRIBUTION. — Palearctic.

RECORDS. — Israel, northern and central parts throughout.

# DESCRIPTION

## Male

Measurements (6 ♂♂): total length 8.7-11.0; carapace length 3.9-4.5, width 3.0-3.5, index 1.21-1.30; clypeus index 3.0-3.25; MOQ/cly ratio 1.11-1.25; leg lengths: I 17.4-20.1, II 18.0-20.7, III 13.7-15.9, IV 18.5-21.2; patella-tibia index 1.55-1.69.

**Palpus.** Tibia with relatively slender, brown retrolateral apophysis tapering to an undulating, pointed tip (Fig. 29A-C); conductor (C) with fine barbed inner margins encircles apically about half of bulb; large distal-apophysis (da) extends over nearly entire centre of bulb and ends with a hook (Fig. 29A, C).

## Female

Measurements (10 ♀♀): total length 10.4-14.5; carapace length 3.9-5.0, width 3.1-4.0, index 1.17-1.35; clypeus index 2.29-3.22; MOQ/cly ratio 1.10-1.51; leg lengths: I 16.0-21.5, II 16.4-22.0, III 13.1-17.8, IV 17.7-23.8; patella-tibia index 1.46-1.63.

**Epigynum.** Rather variable (Fig. 30A-E). Slender or broad gutter-like median septum widens anteriorly or anterior walls close on entrance with blackish cap-like thickenings (Fig. 30A-E); anterior and lateral distentions of swollen cross-arm of anchor-like septum vary greatly. Spermathecae and inner folds show negligible variation in form except for little differences in sclerotization (Fig. 30F).

## COMMENTS

*Pisaura mirabilis* is well-known. Its peculiar

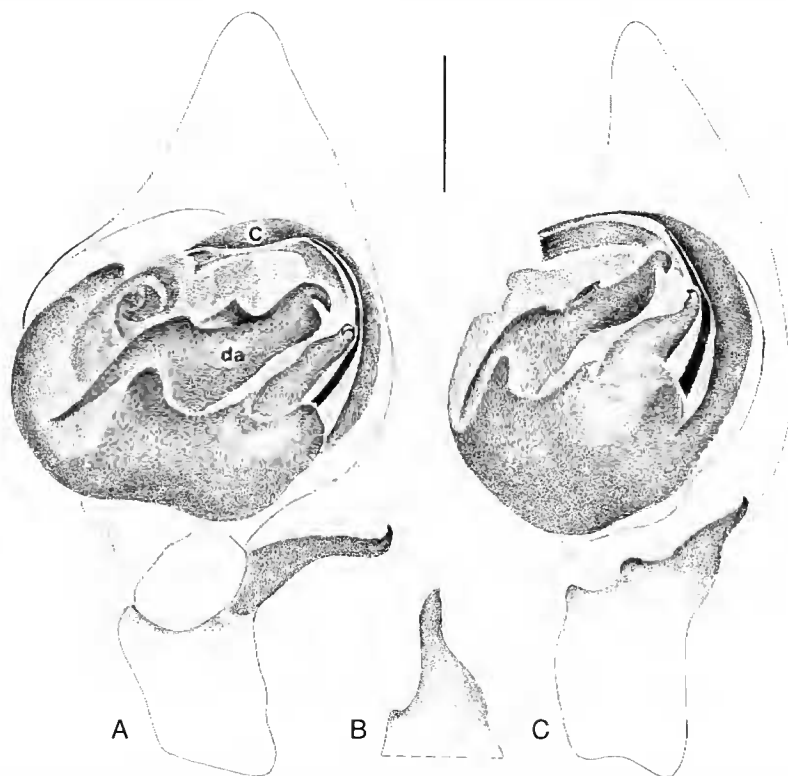


FIG. 29. — *Pisaura mirabilis* ♂, left palpus; A, ventral view; B, lateral view of tip of tibial apophysis, viewed from below, detail; C, nearly lateral view (partly from below). Abbreviations: C, conductor, da, distal apophysis. Scale bar: 0.5 mm.



mating behaviour where the male presents an ensnared fly to the female to masticate while copulating and serving it again on insertion of its second palpus, was described already by Hasselt (1884, cited and corroborated by Gerhardt 1923: 28-31). Their spherical egg-sac is held for a time with the chelicerae and palpi under the carapace. After the construction of the nursery, the female rests on its walls or nearby until the young emerge. These are grouped for a few days in a close cluster and then disperse in all directions. The young according to Lenler-Eriksen (1969) suspend threads for the detection of prey.

Adult males of *P. mirabilis* in Israel have been collected from February to April and females, often with an egg-sac, were taken from March to May. Although *P. mirabilis* is widely distributed it was merely recorded from Israel. Strand (1914: 185, as *rufofasciata*) was the first (♀ with egg-sac, SME, 4885; examined) and the next was Brignoli (1984: 36) reporting on females that have been detected among *O. P.*-Cambridge's (1872) material (HECO, B.1524, t.7; 2 ♀♀ examined). Brignoli (1984), however, on addressing the problematics in identifying the females, separated several forms but overlooked the many

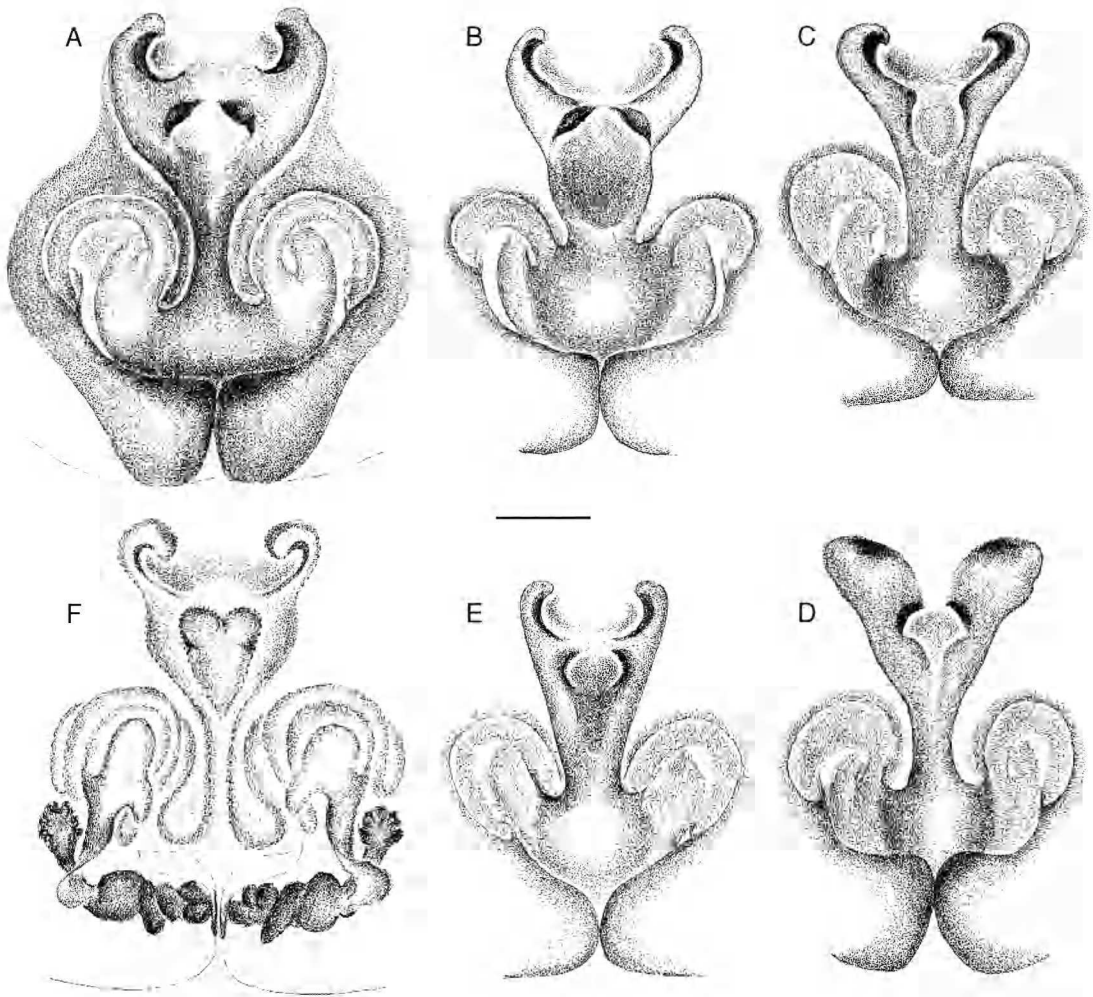


FIG. 30. — *Pisaura mirabilis* ♀; A-E, various epigyna, ventral view; F, spermathecae, dorsal, inner view. Scale bar: 0.25 mm.

intermediate forms found in the same population in the shapes of the epigyna (Fig. 30A-E). His distinctions of the different female species are impracticable and their alleged ranges of distribution are rather confused. If there are sibling species in *P. mirabilis* these should not be solely based on females but substantiated by males, e.g. *P. maderiana* Schmitz, 1895 authenticated by Wunderlich (1987: 230, figs 609-610, ♂).

***Pisaura consocia*** (O. P.-Cambridge, 1872)  
(Figs 28, 31, 32)

*Dolomedes consocius* O. P.-Cambridge, 1872: 320; ♂ syntype from the Plains of the Jordan, Israel (HECO, B.1524, r.3; examined).

*Pisaura consocia* – Simon 1892: 83. – Roewer 1954a: 119. – Bonnet 1958: 3674. – Blandin 1976: 922, figs 11, 14. – Brignoli 1984: 39, figs 12, 14, 16.

**DIAGNOSIS.** — The shape of the tibial apophysis and sclerites of the male palpus of *P. consocia* and the form

of the epigynal plate and spermathecae of the female differ clearly from all other *Pisaura* species.

**DISTRIBUTION.** — Israel, Lebanon, Syria.

**RECORDS.** — Israel, throughout northern and central parts.

**DESCRIPTION**

*Male*

Measurements (10 ♂♂): total length 7.4-10.3; carapace length 3.4-4.3, width 2.7-3.4, index 1.20-1.29; clypeus index 3.0-3.6; MOQ/cly ratio 1.10-1.29; leg lengths: I 15.5-20.2, II 16.0-20.3, III 12.5-16.6, IV 15.9-20.9; patella-tibia index 1.51-1.69.

**Palpus.** Blackish retrolateral apophysis widened and scooped at end, terminating with pointed hook (Fig. 31A, B); black conductor, roughened on inner margin, rises upright apically; embolus splits at base into main filament that extends almost to tip of conductor, and short, pointed

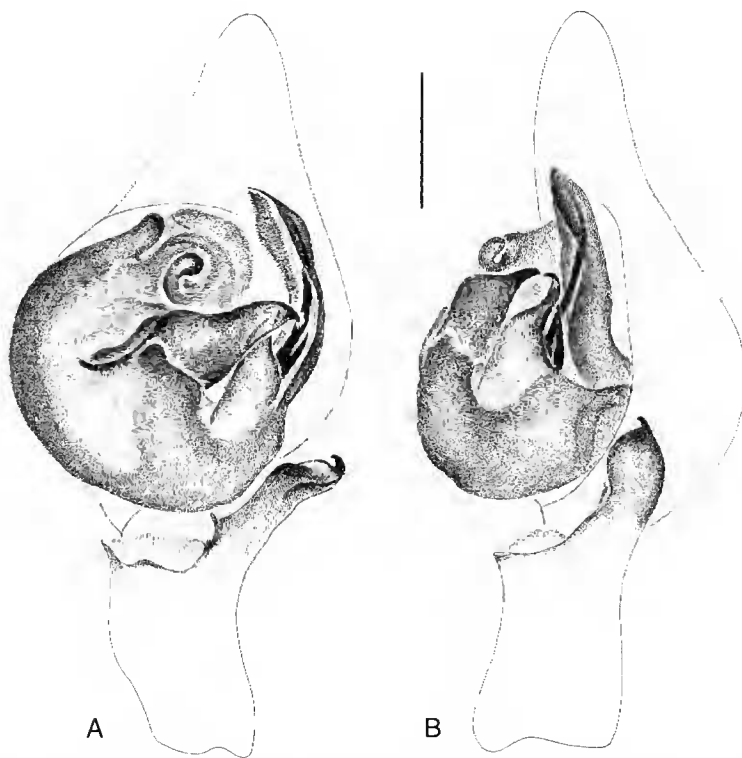


FIG. 31. — *Pisaura consocia* ♂, left palpus; A, ventral view; B, nearly lateral view, partly from below. Scale bar: 0.5 mm.

stylet (Fig. 31A, B); gradual tapering distal-apophysis extends above hooked median-apophysis.

#### Female

Measurements (10 ♀♀): total length 7.6-13.9; carapace length 3.5-4.8, width 2.9-3.8, index 1.21-1.29; clypeus index 2.8-3.5; MOQ/cly ratio 1.13-1.37; leg lengths: I 14.5-20.5, II 14.6-20.6,

III 12.8-17.9, IV 16.4-23.0; patella-tibia index 1.43-1.56.

**Epigynum.** Fine tip of ridged median septum extends into anterior cavity edged by brown, arched rims (Fig. 32A); cross-arm of anchor-like septum partly encircles deep depressions on each side; sclerotization of cross-arm may vary slightly, outlines strong or feebly pronounced; shape of spermathecae and inner folds as in Fig. 32B.

#### COMMENTS

Adult males are found from February to May and females from February to June. Females with an egg-sac were collected in May. Following the description of *P. consocia* by O. P.-Cambridge (1872: 321) from Israel and Lebanon (Ain Ata), it was recorded from the Middle East by Costa (1875: 30, Jericho), Simon (1892: 83, Jerusalem to Nazareth and Tel el-Kadi = Dan), Pavesi (1895: 9, Mar Saba), Kulczyński (1911: 48-51, pl. 2, figs 57-59, Jerusalem; Beirut, Lebanon), Strand (1913: 160, Jaffa; ♀ SMF, 4875; examined) and Kerville (1926: 69, Beit Meri near Beirut, Lebanon and surroundings of Damascus, Syria).

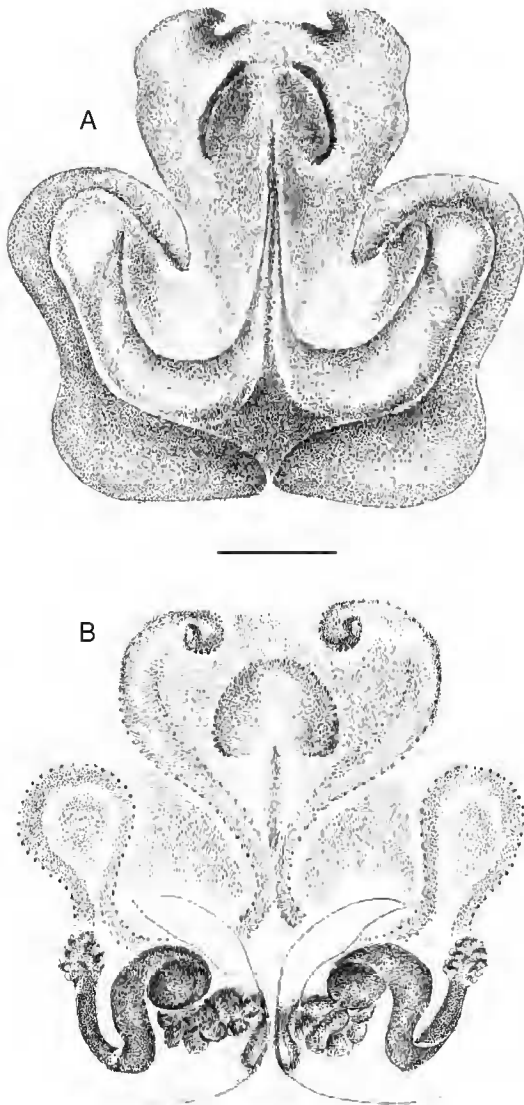


FIG. 32. — *Pisaura consocia* ♀; A, epigynum, ventral view; B, spermathecae, dorsal inner view. Scale bar: 0.25 mm.

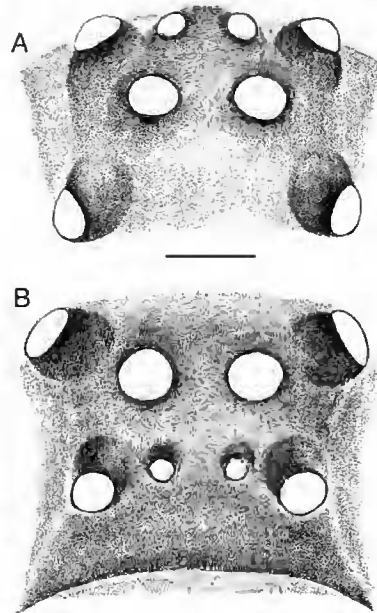


FIG. 33. — *Rothus*, eye arrangement; A, dorsal view, detail; B, frontal view. Scale bar: 0.5 mm.

# Genus *Rothus* Simon, 1898

TYPE SPECIES. — By original designation: *Rothus purpurissatus* Simon, 1898: 294.

## DESCRIPTION

Large pisaurids, females may reach over 16 mm in body length. Coloration variable. Carapace longer than wide with relatively narrow clypeus. Anterior row of eyes straight in dorsal view, procurved in frontal view (Fig. 33A, B); anterior-median eyes markedly smaller than all eyes, and posterior-medians largest of all eyes. Median-ocular-quadrangle posteriorly much wider than anteriorly, and over 2 times longer than clypeus height. Labium, endites and cheliceral dentition as in *Pisauma*. Legs long and spinose, formula: IV, II, I, III, or IV, I, II, III. Male palpus bears an embolus that issues on the mesal side and apophyses extending across regulum (Fig. 34A). Female epigynum comprises a depression edged

by lateral oval plates connected posteriorly, along epigastric furrow (Fig. 35A).

## REMARKS

The genus *Rothus* has been revised by Blandin (1976, 1977). With several synonymies cleared and available types checked, the validity of only three out of seventeen African species has been proved. The one species found in Israel forms herein the first representative of the genus *Rothus* in Asia.

## *Rothus purpurissatus* Simon, 1898 (Figs 33-35)

*Rothus purpurissatus* Simon, 1898b: 14; ♀ holotype from Keren, northern Ethiopia, *leg.* Schweinfurth (MNHN, B. 2025. AR. 3254; examined).

*Rothus pictus* Roewer, 1954b: 210; ♂ and ♀ syntypes from Tete, Mozambique (SMF, RII/10332/82; examined), synonymized by Blandin (1977: 552, figs 10-12, 15-27, 31).

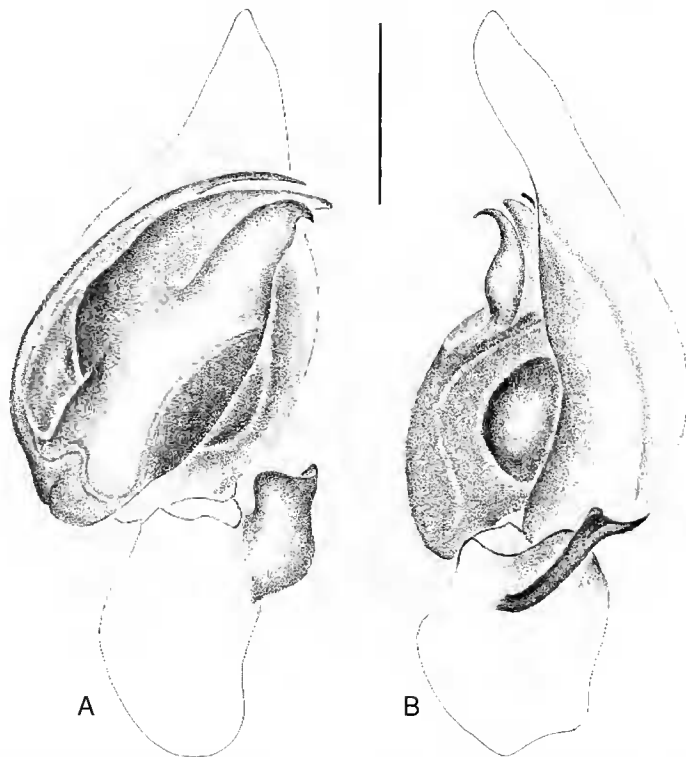


FIG. 34. — *Rothus purpurissatus* ♂ (? allotype) from Mozambique (*R. pictus* Roewer); mirror image of right palpus; A, ventral view; B, lateral view. Scale bar: 0.5 mm.

**DIAGNOSIS.** — *Rothus purpurissatus* can be distinguished from all other *Rothus* species by the shape of the tibial apophysis and the tegular apophyses of the male palpus, and by the peculiar epigynum and shape of the spermathecae of the female.

**DISTRIBUTION.** — South Africa, Mozambique, Angola, Zaïre, Rwanda, Cameroon, Ethiopia, Israel — new record.

**RECORDS.** — Israel, Banyas, Anja e-Tahta, En Duyuk.

#### DESCRIPTION

##### Male

Note: No adult male has been collected thus far in Israel, and drawings provided are of the male (? allotype) *R. pictus* from Mozambique.

**Palpus.** Relatively small. Apically furtrowed tetro-lateral apophysis of tibia appears quadrate on ventral view, but slender and pointed in profile (Fig. 34A, B). Surface of cymbium depressed along lateral margin. Inclined tegulum extends into immovably attached apophyses (Fig. 34A, B).

##### Female

Measurements (6 ♀♀): total length 11.5-16.2; carapace length 5.5-7.6, width 4.5-6.1, index 1.22-1.34; clypeus index 1.9-2.5; MOQ/cly ratio 2.0-2.1; leg lengths: I 22.0-30.5, II 21.5-31.3, III 17.9-25.3, IV 22.4-31.0; patella-tibia index 1.36-1.46.

**Epigynum.** Relatively large. Bottom of central yellow depression covered with setae. Lateral ovoid, yellow-brown platelets connected medially by thick, black and sclerotic band (Fig. 35A). Spermathecae consist of small, black nearly cylindrical bodies placed at ends of inner, dark, semi-circular folds (Fig. 35B).

##### COMMENTS

Adult females of *R. purpurissatus* have been collected in Israel in May-July and September. All have been found near water along the Rift Valley marking thus the classical route of infiltration of an African element into the local fauna.

##### Acknowledgements

I would like to thank Prof. Y. Lubin, Institute for Desert Research, Ben Gurion University, for the kindness and support always extended. I am deeply indebted for the loan of types and specimens to Dr. C. Rollard, Muséum national d'Histoire naturelle, Paris (MNHN), Ms. M. Atkinson, Hope Entomological Collections, University Museum, Oxford (HECO), Dr. M. Grasshoff, Natur-Museum und Forschungs-Institut Senckenberg, Frankfurt (SMF), Dr. J. Gruber, Naturhistorisches Museum, Vienna (NMW), and Dr. K. Mikhailov, Zoological Museum of the Moscow State University (ZMUM). This research was supported by the Israel Science Foundation of the Israel Academy of Sciences and Humanities.

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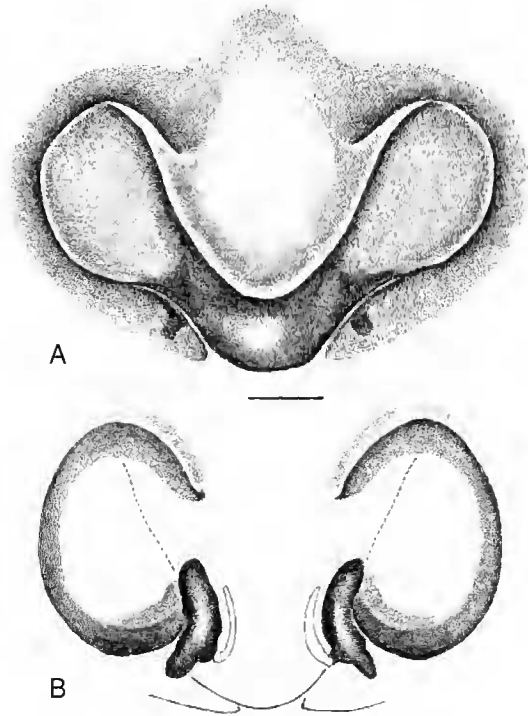


FIG. 35. — *Rothus purpurissatus* ♀; A, epigynum, ventral view; B, spermathecae, dorsal, inner view. Scale bar: 0.25 mm.

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Submitted on 16 April 1998;  
accepted on 6 July 1998.